THE

ADVISORY DEPARTMENT

IMPERIAL COLLEGE OF TROPICAL AGRICULTURE

IMPERIAL MYCOLOGICAL INSTITUTE
11 JULY 1936

REPORT

ON THE

Agricultural Department

ANTIGUA

1935.

ISSUED BY THE COMMISSIONER OF AGRICULTURE

FOR THE WEST INDIES.

1936.

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TABLE OF CONTENTS.

	Page.
SEC. I. GENERAL AGRICULTURE	(1—2)
Weather Conditions	1
Chief Crops	1
Agricultural Exports	2
SEC. II. WORK OF THE DEPARTMENT OF AGRICULTURE	(3—36)
Plant Importation	3
Plant and Seed Distribution	3
Work at Greencastle Experiment Station	4
Nursery Work	4
(a) Sugar Cane	4
(b) Fruit and Vegetables	4
Fruit Plot	5
Experimental Work	5
Model Allotment	5
Work in Connection With the Sugar Cane Crop	12
Field Statistics	12
Experiments With Sugar Cane	20
I. Experiment in connection with Germination of Sugar Cane	20
II. Varietal Experiments	23
III. Manurial and Cultural Experiments	27
IV. Varietal Susceptibility to Moth Borer Attack ..	35
Cotton Seed Selection	35
Agricultural Education	36
Statistics	36
Publications	36
Correspondence	36
Official Visits	36
Acknowledgments	36
SEC. III. FINANCIAL STATEMENT AND STAFF OF THE DEPARTMENT.	(37—38)
Staff of the Department	38
SEC. IV. SUMMARY OF LEGISLATION AFFECTING ANIMALS, PLANTS, CROPS, ETC.	38
APPENDIX I.	
Land Settlement	39
APPENDIX II.	
Meteorological	41

LETTER OF TRANSMITTAL.

C.A.205/36. 3rd March, 1936.

Sir,

I have the honour to transmit the annual report of the Agricultural Department of Antigua for the year 1935.

2. The total value of the chief products of agriculture and livestock, of which sugar and its by-products constitute nearly 98 per cent, amounted to approximately £160,000, 15 per cent less than in 1934 and 20 per cent less than in 1933.

3. The sugar crop of 1935 amounted to 17,489 tons as compared with 20,677 tons in 1934 and 23,875 tons in 1933. This substantial reduction was mainly the result of very unfavourable rainfall distribution during the growing period of 1934.

4. The cotton crop picked in 1935 was planted in 1934 at a time when market prices and the general outlook for the Sea Island cotton industry only justified the cultivation of a relatively small area. Actually only 200 acres were planted from which 32,950 lb. of lint were exported at a value of £2,062. The very marked improvement in Sea Island cotton market conditions during 1935 has resulted in the planting of an area of 612 acres to be picked in 1936. For the same reason the West Indian Sea Island Cotton Association has authorised the production of 120,000 lb. of lint in 1937, representing an area of 1,200 acres to be planted in 1936.

5. The activities of the Department throughout the year have been chiefly limited to the continuation of the sugar cane experimental work conducted in co-operation with the Sugar Cane Investigation Committee of Antigua under the direction of Mr. P. E. Turner, Adviser in sugar cane experiments to the Commissioner of Agriculture. Preliminary results of considerable value to the sugar industry have already been obtained from the scheme of experiments. These results, together with the criticisms of the technical officers, are set forth in detail.

6. It is gratifying to record that the persistent efforts of the Agricultural Officers to obtain information relating to the sugar industry, namely varietal and yield statistics, methods of cultivation, manurial treatments, etc., have met with an increased response from planters. It is unfortunate that some planters are not yet convinced of the importance to themselves and the industry as a whole of supplying this information.

7. A survey of the sugar cane soils of Antigua has been started and it is hoped in time to determine the soil type of almost every sugar cane field in Antigua. The resulting information will be of great value in determining the suitability of varieties for specific districts and soil conditions and the response of the different soil types to manurial treatments. The thanks of the sugar cane planters are due to Mr. C. F. Charter, B.A., Agronomist to the Gunthorpes Estates for the assistance he has given and is giving to the Agricultural Superintendent in connexion with this survey.

8. It is much to be regretted that *Lixophaga diatraeae* the parasite of the small moth borer of the sugar cane, which gives promise of permanent control of the borer in St. Kitts, has failed to become established in Antigua. In consequence of this failure, Mr. H. E. Box, Entomologist attached to the Agricultural Advisory Department of the Imperial College of Tropical Agriculture, began trial introductions of *Metagonistylum minense*, the Amazon fly, another parasite of the moth borer, which gives promise of successful control of the pest in St. Lucia.

9. Some measure of anxiety was felt during the year over the poor growth, and in some cases death, of canes attacked by root disease. It was found possible for Dr. H. R. Briton-Jones, Professor of Mycology at the Im-

perial College of Tropical Agriculture, to visit Antigua and report on the disease. His report has been published in "Tropical Agriculture", volume XIII, No. 1. January, 1936.

10. Other activities of the Department include work at the Greencastle Experiment Station, the supervision of the Land Settlement schemes, and agricultural education.

11. At the Experiment Station much useful information has been acquired in respect of fruit and vegetable crops and in the cultivation of a model allotment, information which will be of great value when further Land Settlement schemes are under consderation.

12. The Land Settlement areas at Greencastle, Matthews and Jonas's are now almost completely settled. Sugar cane is by far the most important cash crop cultivated on these settlements and it is noteworthy that the average yield per acre of canes was respectively 8.5, 6.6 and 10.9 tons in 1935 compared with the Island's (chiefly plantation's) average of 15 tons per acre. It is hoped that in due course with improved methods that the standard of cultivation will improve and be reflected in greater crop yields. It is now desirable that further areas should be considered for extending land settlement.

13. The Department has continued to devote considerable time to agricultural education. Lectures have been given to teachers in the primary schools and periodic visits were made to school gardens.

14. The Agricultural Department has been fully staffed during the year and I wish to record my appreciation of the manner in which the staff has carried out its duties.

I have the honour to be,

Sir,

Your obedient servant,

(Sgd.) G. A. JONES,

Commissioner of Agriculture.

The Honourable,

The Colonial Secretary,

ANTIGUA, B.W.I.

Report on the Agricultural Department, Antigua.

For the Period January to December, 1935.

SECTION I. GENERAL AGRICULTURE.

Weather Conditions.

The mean rainfall for 1935 amounted to 38.31 inches. In the South and South East portions of the island the distribution as a rule was good and the total rainfall fair, but the North and North East districts suffered a prolonged drought. Good rains were general in November and in early December, and at the end of the year prospects for 1936 were fair.

Chief Crops.

(*A*) *Sugar.* The average rainfall in 1934 was 41.86 inches but the distribution was unfavourable, over sixteen inches falling during the months of November and December with a very low rainfall in October, a month when a plentiful supply of water is needed for rapid cane growth.

The 1935 crop amounted to 17,389 tons grey crystals together with 100 tons muscovado. The average price per ton realised for the grey crystals exported was £9. 8s. 3d. per ton.

Yields of cane * were poor averaging less than 15 tons per acre as compared with 15.2 tons in 1934 and with 20.1 tons in 1933.

At the end of the year the 1936 crop was estimated at about 19,000 tons provided reasonable rains fell during January 1936.

The moth borer (*Diatraea saccharalis*) has continued to be the major pest of sugar cane. Counts conducted by the Antigua Sugar Factory in 1935 indicated an increase in borer damage as compared with counts made in 1934.

A survey conducted by Mr. H. E. Box who has been in charge of the work in connection with moth borer has shown that Lixophaga diatraea, the parasite introduced during 1932 had largely disappeared and for some so far unascertained reason was slowly dying out. In consequence of this, a trial was made with the Amazon fly (Metagonistylum minense) experimental shipments having been imported from St. Lucia where this parasite has proved very successful.

The white grub (Lachnosterna antiguae) has done damage in many fields especially to recently germinated cane plants. This insect which has been known in Antigua for many years and which has at times caused serious losses over small areas, appears to be responsible for considerable damage the extent of which it is difficult to estimate. It is probably one of the factors connected with the root disease complex.

Root disease is the main disease of sugar cane in Antigua and is common in most fields where soil or climatic conditions are unfavourable. During November a visit to Antigua in connection with root disease was made by Dr. H. R. Briton-Jones, Professor of Mycology at the Imperial College of Tropical Agriculture, a report on which visit has been published in Tropical Agriculture, January 1936.

Gumming Disease. Leaf symptoms of gumming disease are common in fields of Ba.11569 but Briton-Jones (loc. cit.) considers that the risk of this variety breaking down under the disease is not great enough to call for any restriction in its cultivation as it is at present the nearest approach to a "general purposes" cane for Antigua conditions.

(*B*) *Cotton.* The 1935 crop was reaped from about 200 acres: the total production was 32,350 lb of clean lint and 600 lb stains. The entire crop was sold in the United Kingdom at prices varying from 1/2 to 1/3½ per lb. for clean cotton.

The area planted for the 1935-1936 crop was 612 acres. Germination was good, and except in a few localities, chiefly in peasants' cotton, where the cotton caterpillar (Alabama argillacea) had done damage, the crop had grown well by the end of December, and prospects were good for the earlier planted fields.

* Estate yields only.

Pink Boll worm (Platyedra gossypiella) had appeared in most districts by the end of December and it seemed probable that the yield from the later planted fields would be poor.

Increased interest is being shown in cotton cultivation both by planters and by peasants as a result of the rise in price of cotton and it is probable that the acreage planted in 1936 for the 1936-37 crop will be greater than has been the case for several years.

The Antigua Cotton Growers' Association.

Peasants' cotton was again purchased at the Antigua Cotton Factory, 67,600 lb. clean seed cotton being purchased at 2d. per lb., this sum being regarded as first payments to be followed by a bonus equivalent to 75 per cent. of the profits on sale of the lint.

The Antigua Cotton Growers' Association continued its membership of the West Indian Sea Island Cotton Association and was represented at the meeting of that body held in St. Vincent at the end of December and the beginning of January by Mr. E. Dew.

Agricultural Exports.*

The following table shows the chief agricultural products exported during the years 1933, 1934 and 1935.

Article.	1933.		1934.		1935.	
	Quantity.	Value.	Quantity.	Value	Quantity.	Value.
		£		£		£
Sugar (Crystals)	22,373 tons	194,703	19,505 tons	182,096	16,072 tons	151,249
Sugar (Muscovado)	...	...	...	...	100 tons	800
Molasses (V. Pan)			808,459 gals.	2,515	324,562 gals	2,188
Molasses (Muscovado)	820,232 gals.	1,709				
Fancy Syrup			32,715 gals.	1,968	33,802 gals.	1,690
Rum	...	...	851 gals.	133	2,008 gals.	293
Cotton (Lint)	8,400 lb.	420	9,600 lb.	480	32,950 lb.	2,062
Lime Juice (Raw)	9,189 gals.	557	3,712 gals.	142	6,916 gals	305
Green Limes	85 brls.	22	97 brls.	85	77 brls.	57
Lime Oil	80 gals,	874	40 gals.	395	56 gals.	448
Tamarinds	495 brls.	427	152 brls.	93	461 brls.	295
Tomatoes	13 crts.	3	...	...	...	...
Hides and Skins		85		75		204
Coconuts	33,400	135	400	2	2,300	9
Onions	26 crts.	8	10 crts.	6	...	...
Horses	4	40	2	25	8	96
Asses	1	3	6	7	16	64
Sheep	3	15	...	...	...	...
Mules	7	40	1	12	1	10

*Figures supplied by Treasury.

SECTION II. WORK OF THE DEPARTMENT OF AGRICULTURE.

PLANT IMPORTATIONS.

During the year the following plants and seeds were imported:—

Plants or Cuttings.

Congea Tomatoes	5 cuttings from Dominica.

Budwood.

Sue Gin Gong Orange	50 buds from Trinidad.
Lamb's Summer Orange	50 „ „ „
Ruby Orange	50 „ „ „
Parson Brown Orange	50 „ „ „
Sanford's Mediterranean Orange	50 „ „ „
St. Michael Orange	50 „ „ „

Seeds.

Cotton Seed	86 lb from Montserrat.
Broom Corn	2 lb from U.S.A.
Onion Seed	39 lb from Teneriffe.
Cauliflower Seed (Early Patna)	6 oz from India through the Commissioner of Agriculture.
„ „ (Burpee's Dryweather)	1 oz. from U.S.A.
Vegetable Seeds	26 lb from U.S.A.
Flower Seeds	23 pkts from U.S.A.
Cassia Seeds	7 pkts from Trinidad.

Early Patna Cauliflower under Antigua conditions bears small to medium heads of excellent flavour. The best results are obtained during the cool season.

Burpee's Dryweather Cauliflower produces larger, darker and coarser heads than Early Patna and appears not to be so well suited to local conditions.

PLANT AND SEED DISTRIBUTION.

The following plants and seeds were distributed during the period under review:

Cane Cuttings	34,695*
Onion Seedlings	40,100
Tomato „	170
Pineapple suckers	228
Budded Oranges	95
„ Limes	12
„ Grapefruit	6
„ Tangerina	4
„ Mangoes	68
„ Avocado Pears	4
Bread Fruit	69
Papaw	30
Eucalyptus	13
Flamboyant	29
Mahogany	7
Whitewood	4
Gliricidia	225
Casuarina	110
Cassia	90
Bougainvillea	104
Crotons	58
Miscellaneous Ornamentals	201
„ Trees	6
Onion Seed	39 lb.
Cauliflower Seed	6½ oz.
Other Vegetable Seed	25½ lb.
Flower Seeds	23 pkts.

* B.2935 21610
B.726 6685
B.891 2850
B.H.10/12 1500
P.O.J.2878 1250
G.119 800

34695

WORK AT GREENCASTLE EXPERIMENT STATION.

NURSERY WORK.

(A). *Sugar Cane.* The following varieties were grown as plant canes:—B.374, B.726, B.891, B.2935, P.O.J.2878, G.119, F.C.916, F.C. 988, M.3, M.7 and M.42 together with specimen plots of B.3922, B.147 (B.4507), B.4596, B.417, S.C.12.4, P.O.J.36, P.O.J.213, P.O.J.234, P.O.J.2714, P.O.J.2725, P.O.J.2727, Co.213, Co.221, and Co.281.

B.H.10.12, B.374, B.726, B.891, B.2935, G.119, P.O.J. 2878, F.C.916, F.C.988, M.3, M.7 and M.42 were cultivated as first ratoons.

B.726 has now been grown at the Experiment Station for four years both as a plant cane and as a ratoon and does particularly well in this area.

B.2935 again grew well as a plant cane but this season the ratoons showed a high percentage of dry canes resulting from root disease, while other varieties on adjacent plots were healthy and vigorous. Planters are advised not to extend this variety too rapidly on heavy non-calcareous soils until they have had an opportunity of observing its ratooning powers when grown on such soils.

As stated in the report for 1934, F.C.916, F.C.988 and the three M. canes are being compared with B.H.10.12 in a preliminary yield experiment which will be reaped in 1936. All varieties germinated well and made rapid early growth, but suffered from the dry weather early in 1935. F.C.988 is obviously inferior to the other varieties and will be retained in the nursery only in a specimen plot.

(B). *Fruit and Vegetables.*

Citrus Fruit:—The following citrus fruit plants were propagated during the year 1935:—

Valencia Orange	48
Archbishop Orange	50
St. Michael's Orange	36
Sue Gin Gong	26
Ruby	14
Sanford Mediterranean	11
Parson Brown	8
Lambs Summer	8
Tangerine	6
Mandarin	6
Budded Limes	14
	227

A new citrus nursery of approximately 170 stocks was planted for budding during 1936.

Mangoes.—Owing to the fact that the attention of the Department was occupied with the reaping of sugar cane experiments during the months of April and May—the best budding season—an attempt was made to conduct the annual mango budding campaign at other times of the year. The attempt has not proved successful and budding will have to be carried out in April and May in future. Only 14 Julie and 16 Bombay mangoes were successfully worked during 1935. The stocks which did not take will be cut back for budding during 1936.

Avocado Pears.—Eighteen pears of the variety of St. Anne were successfully propagated and a further eighteen of the variety Pollock, which is reported to be one of the best varieties known in Trinidad.

Bread Fruit.—Ninety-six plants were raised from root cuttings during 1935.

Onions.—Several thousand onion slips were raised

Yams and Eddoes.—Nursery plots were grown of the following varieties:—

Yams—Seal Top, Bugle Horn, Cush Cush, Light Red, Lisbon and Crop.

Eddoes—Tannia Eddoe, Tannia Yellow, Tannia White, Tannia Roliza White, Tannia Priete and Tannia Roliza.

FRUIT PLOTS.

Citrus.—The plots established in 1931, 1932 and the orange plot planted in 1933 again made good growth. The more advanced trees received in April 1935 an application of 1 lb. Sulphate of potash and 4 lb. Superphosphate per tree. Most of the trees bore fruit, some carrying a heavy crop for their age. The quality of the fruit was generally good and was much better than was the case with the fruit reaped in 1934.

The plot of Marsh's Seedless Grape Fruit planted in 1933 improved somewhat during the year: the wind break has not yet grown sufficiently to provide adequate shelter.

The experience of the season under review confirms the opinion expressed in the previous report that citrus fruit can be grown in the Bendals district in the vicinity of the stream provided the following conditions are fulfilled:—

(i) Selection of a site protected from the wind of which citrus fruit trees are particularly intolerant.

(ii) Thorough mulching with trash or other organic matter at the beginning of the dry season.

(iii) Spraying with 3 per cent. Sulphemulsol solution whenever scale insects are prevalent. In the dry season a thorough spraying every three or four weeks is required.

Mangoes.—Most of the mango trees planted west of the stream are now growing well and the more advanced trees fruited during the year. The fruit was of excellent quality and found a ready market locally though as a rule rather smaller than the same variety (Julie) imported from Dominica.

Orchard.—An orchard containing Citrus, high class mangoes and Avocado pears is being established between the stream and the manurial experiment planted at the end of 1934. A full record is being kept of costs and portion of the area has been planted under catch crops sweet potatoes and pineapples—to cover portion of the expenses until the trees come into bearing.

EXPERIMENTAL WORK.

(A) Sugar Cane. For convenience the result of the germination experiments conducted at the experiment station are included in the section on general sugar cane experiments.

(B) Sweet Potatoes. The variety trial planted in June 1934 was reaped in February 1935. The lay out was a six by six Latin Square the individual plots being each 1/69 acres in area. At the time of reaping it was observed that the plots of White Gilkes were not pure but were contaminated with Red Nut; the yield from these plots is returned as "mixed."

The following table shows the mean yields expressed as tons per acre.

Variety.	Yield per acre
V.52	7.95
Brookes Seedling	7.50
Moore	6.68
Red Nut	6.27
Mixed White Gilkes & Red Nut	6.27
Bert	4.62

Differences will not exceed .31 tons per acre more often than once in 100 times. V.52 is significantly better than any other variety.

V.52 has headed the list for two years in succession and on both occasions Bert has given the lowest yield.

The same six varieties have again been planted in a varietal trial this time in October to determine their suitability for cultivation during the cooler months.

MODEL ALLOTMENT.

The report on the model allotment covers the period Oct. 1st. 1934 to Sept. 30th 1935. The statement of annual expenditure and revenue for the various plot units is shown in Table "A" and the statement of revenue and expenditure in connection with the individual crops is shown in Table "B".

The total expenditure during the period under review amounted to *£32. 18. 1. and the total revenue to £46. 18. 0., there being a profit of £13. 19. 11.

The total expenditure since the laying down of the plots amounted to £207. 0. 4½. and the total revenue of £201. 9. 4. The adverse balance which was £19. 10. 11½ at the end of the 1933-34 season has thus been reduced to £5. 11. 0½. The fruit plot is now beginning to give small returns and during the next season should be paying its way.

The above statements of revenue and expenditure made no allowance on the expenditure side for the supervision given the labourers by the staff of the Department nor for the instalments of the purchase price of the land. On the other hand no allowance has been made on the revenue side for the fact that in most allotments the owner himself works on the land for about two days per week.

Assuming a purchase price of £10 per acre which is the maximum price on the Greencastle estate the cost of a five acre allotment would be £50 and the annual instalment £2. 10. 0.

It is difficult to estimate the cost of supervision but this would hardly exceed the sum of £6 per annum (based on the salary of the Foreman and the proportion of his time devoted to the model allotment). If this figure is accepted the expenditure must be increased by £8. 10. 0.

On the other hand the revenue of the allotment must be credited with a sum equivalent to two days work by the holder, viz £7. 16. 0. (at 1/6 per diem) and with sundry small sums paid for marketing, reaping etc., of vegetables which would in many cases be done free of cost by members of the allottees family.

The conclusions reached in previous years have in the main been confirmed.

A small profit has been made on sugar cane (plant canes together with first and second ratoons). This profit is somewhat increased if allowance is made for a catch crop of tomatoes and onions reaped early in 1934.

Profits have also been made with sweet potatoes, cassava and certain vegetables, viz, carrots, beet and cauliflowers. Losses have been made with yams, eddoes and tomatoes (grown as a vegetable crop and not as a catch crop for canes).

The loss experienced with tomatoes is the first occasion on which a loss resulted with this crop. It was chiefly due to the selection of a variety which although of good quality proved unattractive to the local market, viz Golden Ponderosa.

* The total expenditure as shown in Table A is £32. 5. 0., but there is an additional £0. 13. 1. for maintenance of a main trench which must be charged to the whole allotment.

TABLE OF PLOT EXPENDITURE AND REVENUE.

PLOT 1.

First Ratoons	1931
Stock Plot	1932
Sweet Potatoes ..	1933
Cassava	1934
Pigeon Pea green dressing	1935

EXPENDITURE.

1934-35.	£	s.	d.
Cassava Crop.			
Weeding	0	0	6
Preparation for Plant Cane.			
Weeding		3	10
Planting Peas ..		3	4
Pulling Peas		1	5
Forking		4	11
		14	0
Previous Exp. ..	3	3	11
Total „ ..	3	17	11

REVENUE.

1934-35.	£	s.	d.
Sale of Cassava ..	1	2	8
Previous Revenue ..	2	9	3
Total „ ..	3	11	11
Profit 1935 ..		8	8
Deficit „			
Total Profit			
Total Deficit ..		6	0

PLOT 2.

First Ratoons	1931
Stock Plot	1932
Sweet Potatoes ..	1933
Eddoes	1934
Pigeon Pea green dressing	1935

EXPENDITURE.

1934-35.	£	s.	d.
Eddoe Crop.			
Weeding	0	1	5
Preparation for Plant Cane.			
Weeding		4	8
Planting Peas ..		3	0
Pulling Peas ..		1	1
Manure and Application		5	7
Forking		4	9
Cambering		1	1
	1	1	7
Previous Exp. ..	3	2	5
Total „ ..	4	4	0

REVENUE.

1934-35.	£	s.	d.
Sale of Eddoes ..	1	2	6
Previous Revenue ..	2	9	3
Total „ ..	3	11	9
Profit 1935			11
Deficit „			
Total Profit			
Total Deficit		12	3

PLOT 3.

First Ratoons	1931
Vegetables	1932
Peas, Beans and Vegs.	1933
Yams	1934
Pigeon Pea green dressing	1935

EXPENDITURE.

1934-35.	£	s.	d.
Yam Crop.			
Weeding	0	1	4
Preparation for Plant Canes.			
Weeding		3	9
Planting Peas ..		3	0
Pulling Peas		1	5
Forking		4	9
		14	3
Previous Exp. ..	11	8	2½
Total „ ..	12	2	5½

REVENUE.

1934-35.	£	s.	d.
Sale of Yams ..	1	14	4
Previous Revenue ..	9	17	5
Total „ ..	11	11	9
Profit 1935	1	0	1
Deficit „			
Total Profit			
Total Deficit		10	8½

PLOTS 4 & 5.

First Ratoons	1931
Vegetables	1932
Stock Plot	1933
Vegetables	1934
Pigeon Pea green dressing	1935

EXPENDITURE.

1934-35.	£	s.	d.
Veg. Crop	3	0	1
Preparation for Plant Canes.			
Weeding		6	8
Planting peas ..		8	8
Pulling Peas		3	7
Manure and Application		9	4
Forking		10	10
Cambering			11
	5	0	1
Previous Exp. ..	15	5	3
Total „ ..	20	5	4

REVENUE.

1934-35.	£	s.	d.
Sale of Vegetables ..	8	11	8
Previous Revenue ..	14	12	0
Total „ ..	23	3	8
Profit 1935	3	11	7
Deficit „			
Total Profit ..	2	18	4
Total Deficit			

TABLE OF PLOT EXPENDITURE AND REVENUE.

PLOT 6.

First Ratoons ..	1931
Pigeon Peas	1932
Pigeons Peas	1933
Stock and Potatoes ..	1934
Vegetables	1935

EXPENDITURE.

1934—1935	£	s.	d.
Potato Crop			
Insect control ..	0	0	5
Vegetable Crop			
Weeding	0	7	5
Forking	0	2	7
Banking	0	3	5
Lining	0	1	1
Manure & Manuring	0	2	9
Refining Beds ..	0	0	10
Tomato Plants and Planting	0	5	3
	1	3	9
Previous Exp. ..	3	3	9
Total Expenditure ..	4	7	6

REVENUE

1934—1935	£	s.	d.
Sale of Potatoes ..	1	7	6
Previous Revenue ..	1	8	10
Total Revenue ..	2	16	4
Profit 1935	0	3	9
Deficit 1935 ..		—	
Total Profit ..		—	
Total Deficit ..	1	11	2

PLOT 7.

Prep. for Canes ..	1931
Plant Canes	1932
1st Ratoons	1933
Stock and Potatoes ..	1934
Vegetables	1935

EXPENDITURE.

1934—1935	£	s.	d.
Potato Crop			
Insect control ..	0	0	6
Vegetable Crop			
Weeding	0	7	5
Forking	0	2	8
Banking	0	3	6
Lining	0	1	2
Manure & Manuring	0	2	9
Refining Beds ..	0	0	10
Tomato Plants and Planting	0	5	3
	1	4	1
Previous Exp. ..	5	1	5½
Total Expenditure ..	6	5	6½

REVENUE

1934—1935	£	s.	d.
Sale of Potatoes ..	1	7	7
Previous Revenue ..	5	10	7
Total Revenue ..	6	18	2
Profit 1935 ..	0	3	6
Deficit 1935 ..		—	
Total Profit ..	0	12	7½
Total Deficit ..		—	

PLOT 8.

Prep. for Canes ..	1931
Plant Canes	1932
1st Ratoons	1933
Potatoes & Cassava ..	1934
Yams & Eddoes ..	1935

EXPENDITURE.

1934—1935	£	s.	d.
Potato Crop			
Insect control ..	0	0	4
Cassava Crop			
Preparation and Planting ..	0	5	11
Weeding	0	0	10
Insect control ..		2	6
Replanting Sticks for Nursery ..	0	0	9
Yam Crop			
Forking	0	3	6
Manure and Manuring	0	6	4
Banking	0	3	10
Planting and Planting Material	0	4	3
	1	8	3
Previous Exp. ..	5	10	9
Total Expenditure ..	6	19	0

REVENUE

1934—1935	£	s.	d.
Sale of Potatoes ..	2	1	6
Sale of Cassava ..	1	13	9
	3	15	3
Previous Revenue ..	5	19	6
Total Revenue ..	9	14	9
Profit 1935	2	7	0
Deficit 1935 ..		—	
Total Profit ..	2	15	9
Total Deficit ..		—	

PLOT 9.

Prep. for Canes ..	1931
Plant Canes	1932
1st Ratoons	1933
Potatoes	1934
Cassava	1935

EXPENDITURE.

1934—1935	£	s.	d.
Potato Crop			
Insect control ..	0	0	4
Cassava Crop			
Weeding	0	8	5
Lining	0	0	9
Forking	0	5	8
Previous Exp. ..	5	10	9
Total Expenditure ..	6	5	11

REVENUE

1934—1935	£	s.	d.
Sale of Potatoes ..	2	13	0
Previous Revenue ..	5	19	6
Total Revenue ..	8	12	6
Profit 1935	1	17	10
Deficit 1935 ..		—	
Total Profit ..	2	6	7
Total Deficit ..		—	

TABLE OF PLOT EXPENDITURE AND REVENUE.

PLOTS 10-12.

Prep. for Canes ..	1931
Plant Canes	1932
1st Ratoons	1933
2nd „	1934
Potatoes	1935

EXPENDITURE.

1934-35.	£	s.	d.
Ratoons.			
Reaping charges ..	0	12	10
Potato Crop.			
Removing trash and stools		13	0
Forking		13	11
Lining		2	0
Banking		11	5
Planting, etc. ..		10	3
Weeding		4	9
	3	8	2
Previous Exp. ..	13	7	1½
Total „ ..	16	15	3½

REVENUE.

1934-35.	£	s.	d.
Canes	2	16	10
Previous Revenue ..	21	4	11
Total „ ..	24	1	9
Profit 1935 ..			
Deficit 1935 ..		11	4
Total Profit ..	7	6	5½
„ Deficit			

PLOTS 13-17.

Provisions	1931
Prep. for canes ..	1932
Plant canes	1933
1st Ratoons	1934
2nd „	1935

EXPENDITURE.

1934-35.	£	s.	d.
1st Ratoons.			
Reaping charges ..	1	6	3
2nd Ratoons.			
Ranging trash ..		3	7
Cambering		7	0
Splitting Banks ..		8	10
Manure and manuring	1	1	3
Weeding		2	8
	3	9	7
Previous Exp. ..	32	11	5
Total „ ..	36	1	0

REVENUE.

1934-35.	£	s.	d.
Canes	6	9	6
Previous Revenue ..	36	2	2
Total ..	42	11	8
Profit 1935 ..	2	19	11
Deficit 1935 ..			
Total Profit ..	6	10	8
„ Deficit			

PLOTS 18-22.

Provisions, Vegetables and Cotton ..	1931
Provisions and Vegetables	1932
Prep. for canes ..	1933
Plant canes	1934
1st Ratoons	1935

EXPENDITURE.

1934-35.	£	s.	d.
Plant Canes.			
Reaping charges ..	2	15	6
1st Ratoons.			
Ranging trash ..		3	6
Cambering		5	3
Splitting banks ..		8	11
Manure and Manuring		12	3
Weeding		1	11
	4	7	4
Previous Exp. ..	31	3	3½
Total „ ..	35	10	7½

REVENUE.

1934-35.	£	s.	d.
Canes	13	1	8
Previous Revenue ..	21	7	6
Total	34	9	2
Profit 1935 ..	8	14	4
Deficit 1935 ..			
Total Profit		..	
„ Deficit ..	1	1	5½

PLOTS 23-27.

Vegetables and Stock	1931
Provisions	1932
Provisions	1933
Prep. for canes ..	1934
Plant canes	1935

EXPENDITURE.

1934-35.	£	s.	d.
Weeding	1	18	7
Cultivation	1	16	8
Manure and manuring		6	10
Plants and planting	2	0	1
Tomato Expenditure (Catch crop) ..		15	2
	6	17	4
Previous Exp. ..	27	19	9½
Total „ ..	34	17	1½

REVENUE.

1934-35.	£	s.	d.
Tomatoes		15	11
Previous Revenue ..	27	8	5
Total „ ..	28	4	4
Profit 1935 ..			
Deficit 1935	6	1	5
Total Profit		..	
„ Deficit ..	6	12	9½

TABLE OF PLOT EXPENDITURE AND REVENUE.

PLOTS 28-30

FRUIT.

EXPENDITURE.

1934-35	£	s.	d.
Weeding	1	8	5
Watering		4	4
Supplying		2	3
Pea Crop		1	10
Potato crop		4	1
Insect control			3
Marketing			3
	2	1	5
Previous Exp.	16	14	2
Total „	18	15	7

REVENUE.

1934-35	£	s.	d.
Mangoes	1	6	2
Breadfruit			4
Guavas			10
Vegetables		12	3
	1	19	7
Previous Revenue		2	0
Total „	2	1	7
Profit 1935			
Deficit 1935		1	10
Total Profit			
„ Deficit	16	14	0

MODEL ALLOTMENT.

TABLE B.

TABLE OF CROP EXPENDITURE AND REVENUE.

CROP.	Plot	Expenditure £ s. d.	Revenue £ s. d.	Profit £ s. d.	Loss £ s. d.
Cassava	1	1 4 5	1 2 8	..	0 1 9
Eddoes	2	1 4 4	1 2 6	..	0 1 10
Yams	3	2 4 2	1 14 4	..	0 9 10
Vegetables	4 & 5	6 15 10	8 11 8	1 15 10	..
Sweet Potatoes	6, 7, 8 & 9	4 14 2	7 9 7	2 15 5	..
Cassava	8	0 10 0	1 13 9	1 3 9	..
2nd Ratoons	10—12	1 6 2	2 16 10	1 10 8	..
1st Ratoons	13—17	2 9 10	6 9 6	3 19 8	..
Plant Canes and Catch Crops*	18—22	19 14 8½	19 1 3	..	0 13 5½
Catch Crop (Tomatoes)	23—27	0 19 5	0 15 11	..	0 3 6

* Plant Cane. Expenditure £16. 1s. 4d. Revenue £13. 1s. 8d. Loss £2. 19s. 8d.
Catch Crop „ £ 3. 13s. 4½d. „ £ 5. 19s. 7d. Profit £2. 6s. 2½d.

ANALYSIS OF REVENUE AND EXPENDITURE VEGETABLES.

	Tomatoes	Egg Plants	Cauliflowers	Beet	Carrots
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
General Preparation	0 19 5	0 4 6	0 2 8	0 4 6	0 4 6
Beds	..	..	0 0 7	0 0 6	0 0 6
Manure & Application	0 8 8	..	..	0 2 0	0 2 0
Insect Control	0 15 7	..	0 3 6	0 3 6	..
Slips or Seed	0 4 2	0 2 6	0 5 0	0 5 0	0 3 9
Planting	0 2 7	0 0 5	0 0 5	0 2 7	0 0 10
Watering	0 3 0	0 2 0	0 6 5	0 2 10	0 2 11
Stakes and Staking ..	0 5 9	..	..	..	..
Reaping & Transport	0 4 10	0 0 3	0 0 3	0 0 3	0 0 3
Marketing	0 2 8	0 0 2	0 0 4	0 0 6	0 0 6
Weeding	0 2 0	0 0 4	0 0 3	0 0 4	0 0 4
Total	3 8 8	0 10 2	0 19 5	1 2 0	0 15 7
Revenue	0 18 0	0 3 5	1 11 6	2 15 5	3 3 4
Profit	..	..	0 12 1	1 13 5	2 7 9
Loss	2 10 8	0 6 9	..	..	..

WORK IN CONNECTION WITH THE SUGAR CANE CROP.

I. Field Statistics.

A questionnaire was sent out by the agricultural department with a view to obtaining definite information as to the acreages under different varieties, the yields per acre of these varieties, the manurial treatment of the fields, the methods of cultivation, the effect of time of planting etc. Although it was impossible to obtain information from some estates it is gratifying to note that returns have been received from a larger acreage than was the case either in 1933 or 1934.

It is hoped in time to determine the soil type of almost every sugar cane field in Antigua: it will then be possible to classify the yield data for as many years as returns are available. The resulting information will be of value in determining the suitability of the present standard varieties for specific districts and specific soil conditions and the response of the different soil types to manurial treatments.

This section of the report contains a summary of certain of the information which has been collected with respect to the 1935 and 1936 crops. As regards yield data consideration has been given only to returns from those fields where the soil type is already known.

ACREAGE OF EACH VARIETY REAPED.

1935 Crop.

VARIETIES.

	B.H. 10·12.	Ba. 11569.	B. 4507 (B. 147.)	P.O.J. 2878.	Mixed.	S.C. 12·4.	B. 6308	B. 4596.	B. 417.	White Trans.	B. 3922.	B. 726	Miscellaneous.
P. Cane Acres	1,141·5	487·25	219	207·75	579	46·25	43·5	12	9·5	4		19	5
%	41·2	17·5	7·9	7·5	20·9	1·7	1·6	0·5	0·3	0·1		0·7	0·1
1st Rat. Acres	776	220·5	353·5	159	420·25	36	35·5	48·75	5		20		4
%	37·3	10·6	17·0	7.7	20·3	1·7	1·7	2·3	0·2		1·0		0·2
2nd Rat. Acres	603·75	124	516	115·5	279·75	27	43·5	42	17	19	28		2
%	33·2	6·8	28·4	6·3	15·4	1·5	2·5	2·4	1·0	1·0	1·5		0·1

FIRST AND SECOND RATOONS.

Acreage receiving Sulphate of Ammonia.

	Total Reaped.	Treated with Sulphate of Ammonia.	Not Treated with Sulphate of Ammonia.
1st Ratoons Acres	2,078·5	1,450·75	627·75
%	100·0	70·0	30·0
2nd Ratoons Acres	1,807·5	648·5	1,159·0
%	100·0	36·0	64·0

Yield Data (Standard Varieties).
Plant Canes. 1935.
varieties.

		B.H. 10·12.			Ba. 11569.			B. 4507. (B. 147)			P.O.J. 2878.		
Soil Type ...		Acres.	Tons.	Yield.	Acres.	Tons.	Yield	Acres	Tons.	Yield	Acres	Tons.	Yield
N.& N. E. Marls	E.	66	1,682	25·5	19½	387	19·8	106	2,464	23·2	10	253	25·3
	M.	41¼	921	22·4	58	1,375	23·7	9	89	9·9	15½	362	22·7
	L.	17	276	16·3	9	252	28·0						
Total ...		124¼	2,879	23·2	86½	2,014	23·3	115	2 553	22·2	25½	615	24·1
Mixed Marl & Lagoon Clay ...	E.	21¾	483	22·3	26¾	600	22·5	46	1,005	21·9			
	M.	6¾	179	26·5	31½	523	16·6				10	167	16·7
	L.	10	167	16·7									
Total ...		38½	829	21·6	58¼	1,123	19·3	46	1,005	21·9	10	167	16·7
Lagoon Clays ...	E.	55½	1,113	20·1	32¾	822	25·1						
	M.				7	152	21·7				12	370	30·8
	L.												
Total ...		55½	1,113	20·1	39¾	974	24·5				12	370	30·8
Central Marls ...	E.	45	1,280	28·5	18	283	15·7	3½	90	25·8			
	M.	17½	508	29·0	12	306	25·5				17½	483	27·6
	L.				10	250	25·0				7	165	23·6
Total ...		62½	1,788	28·6	40	839	21·0	3½	90	25·8	24½	648	26·5
Mixed Marl &	E.	7	210	30·0									
Calc. Clay ...	M.	13	197	15·2	5	120	24						
Tuff ...	L.	5	92	18·4							5	90	18
Total ...		25	499	19·9	5	120	24				5	90	18

YIELD DATA (STANDARD VARIETIES)
PLANT CANES 1935 (*Concluded*).
VARIETIES.

Soil Type.		B.H. 10·12			Ba. 11569.			B. 4507.			P.O.J. 2878.		
		Acres.	Tons.	Yield.	Acres.	Tons.	Yield.	Acres	Tons.	Yield	Acres	Tons.	Yield
Calcareous ...	E.	85¼	2,191	25·7	4	144	36				21½	414	19·3
Clay ...	M.	95½	2,201	23·0	41½	961	23·1				26	674	25·9
Tuff ...	L.	3	68	22·7									
Total ...		183¾	4,460	24·4	45½	1,105	24·2				47½	1,088	22·9
Non-calcareous	E.	35½	782	22·0	15	366	24·4						
Clay ...	M.	19½	334	17·1	7	180	25·7				16	333	20·8
Tuff ...	L.												
Total ...		55	1,116	20·3	22	546	24·8				16	333	20·8
Gritty tuffs ...	E.	22	255	11·6									
	M.	36½	818	22·4									
	L.	22½	401	17·8									
Total ...		81	1,474	18·2									
Alluvial ...	E.	61¾	1,147	18·6									
Soils ...	M.	35	585	16·7									
	L.	12½	203	16·2									
Total ...		109¼	1,935	17·7									

In the above table E indicates planted before Dec. 31st.
M „ „ Jan. 1st—March 31st.
L „ „ after April 1st.

EFFECT OF TIME OF PLANTING ON YIELD.
(ALL FIELDS.)

Time of Planting	B.H. 10·12.			Ba. 11569			B. 4507. (B. 147)			P.O.J. 2878.		
	Acres	Tons	Yield	Acres	Tons	Yield	Acres	Tons	Yield	Acres	Tons	Yield
Before Dec. 31st	399¾	9,251	23·1	116	2,602	22·4	155½	3,559	22·9	41	830	20·2
Jan. 1st March 31st	265	5,743	21·7	160	3·617	22·6	9	89	9·8	97	2,389	24·6
After April 1st	70	1,207	17·2	19	502	26·4				12	255	21.3

The effect of time of planting on yield has been observed now over three crops. Viz: 1933, 1934 and 1935. The following table shows the mean yields of each of the four standard varieties for each of the three crops.

EFFECT OF TIME OF PLANTING ON YIELD. 1933–1935.

TONS PER ACRE.

	B.H. 10.12			Ba. 11569			B. 4507			P.O.J. 2878		
	1933	1934	1935	1933	1934	1935	1933	1934	1935	1933	1934	1935
Nov. 1st.—Dec. 31st	31·13	25·6	23·1	34·8	23·6	22 4	31·9	25·9	22·9	51·2	30·0	20·2
Jan. 1st.—Mch. 31st.	25·3	23·8	21·7	28·6	26·6	22 ·6	26·6	24·3	9·8	37·6	30·8	24·6
After April 1st.	25·3	21·5	17·2	26·1	22·6	26· 4	16·0	21·8	...	21·7	27·4	21·3

Each season the heaviest yields of B.H.10.12 have as a rule been obtained from fields planted before the end of December and this is also the case with B.4507. The effect of time of planting on Ba.11569 is not marked, this being a quick growing variety. With respect to P.O.J.2878 early planting proved beneficial for the 1933 crop but not since then. 1932 was a year of unusually heavy rainfall so that this variety which requires a long growing season with rains early in the year was able to take full advantage of early planting and produce unusually heavy yields for Antigua. 1933 was drier and 1934 even more so, early planting of this variety therefore not benefiting more than later planting.

1935 Crop. 1st Ratoons.

Varieties.

Soil Type.		B.H. 10·12.			Ba. 11569.			B. 4507 (B. 147.)			P.O.J. 2878.		
		Acres.	Tons.	Yield.	Acres.	Tons.	Yield.	Acres.	Tons.	Yield.	Acres.	Tons.	Yield.
N & N.E. Marls	S.A. ...	63½	925	14·6	18	357	19·8	120½	2,134	17·7	60¼	1,050	17·4
	No S.A. ...	28	414	14·8	6½	116	17·9	69	1,026	14·9	22	245	11·1
	Total ...	91½	1,339	14·7	24½	473	19·2	189½	3,160	16·7	82¼	1,295	15·7
Mixed Marls and Lagoon Clay	S.A. ...	18	144	8·0	31	404	13·0	52	641	12·3	...	...	...
	No SA. ...	...	...	...	4	60	15·0	...	...	...	...	...	...
	Total ...	18	144	8·0	35	465	13·25	52	641	12·3	...	...	...
Lagoon Clay	S.A. ...	60	777	13·0	...	...	...	60½	808	13·4	13	87	6·7
	No S.A. ...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	60	777	13·0	...	...	...	60½	808	13·4	13	87	6·7
Central Marls	S.A. ...	55½	862	15·5	17	245	14·4	8	130	16·25	1½	33	22·6
	No S.A. ...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	55½	862	15·5	17	245	14·4	8	130	16·25	1½	33	22·6
Mixed Marl and Calcareous Clay Tuff	S.A. ...	14½	233	16·1	6	102	17·0	...	...	...	...	...	...
	No S.A. ...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	14½	233	16·1	6	102	17·0	...	...	...	...	...	...
Calcareous Clay Tuff	S.A. ...	33¾	551	16·3	32	527	16·5	6	4·7	7·8	10¾	198	18·4
	No S.A. ...	49½	402	8·1	...	...	...	...	...	...	...	...	...
	Total ...	83¼	953	11·5	32	527	16·5	6	47	7·8	10¾	198	18·4
Non-calcareous Clay Tuff	S.A. ...	24	410	17·1	...	...	...	...	...	...	...	...	...
	No S.A. ...	51½	359	7·0	...	...	...	...	...	...	...	...	...
	Total ...	75½	769	10·2	...	...	...	...	...	...	...	...	...
Gritty Tuffs	S.A. ...	9	101	11·2	...	...	...	...	...	...	...	...	...
	No S.A. ...	46	479	10·4	...	...	...	...	...	...	...	...	...
	Total ...	55	580	10·5	...	...	...	...	...	...	...	...	...
Alluvial Soils	S.A. ...	66¾	757	11·4	...	...	...	...	...	...	...	...	..
	No S.A. ...	...	...	...	...	...	...	...	...	...	...	...	...
	Total ...	66¾	757	11·4	...	...	...	...	...	...	...	...	...

1935 Crop. 2nd Ratoons.

VARIETIES.

Soil Type.		B.H. 10.12			Ba. 11569			B. 4507			P.O.J. 2878		
		Acres.	Tons.	Mean Yield.	Acres.	Tons.	Mean Yield.	Acres.	Tons.	Mean Yield.	Acres.	Tons.	Mean Yield.
N. & N.E. Marls	S.A. ...	43	473	11·0	11	134	12·2	109½	1,677	15·3	41	752	18·3
	No S.A. ...	33	353	10·7	19½	228	11·7	182½	1,818	9·9	15	186	12·4
	Total ...	76	826	10·9	30½	362	11·9	292	3,495	12·0	56	938	16·75
Mixed Marls & Clay Lagoons	S.A. ...	9	90	10	...	...	...	20	166	8 3	...	...	...
	No S.A. ...	7	55	7·9	.	...	...	64	586	9·2	...	...	..
	Total ...	16	145	9·1	...	...	..	84	752	9 0	...	. .	...
Lagoon Clay	S.A. ...	...	...	..	.	...	..	37½	389	10 4	...	. .	...
	No S.A. ...	...	...	...	...	...	.	12	102	8·5	12	70	5·8
	Total ...	...	...	...	...	..	..	49½	491	9·9	12	70	5·8
Central Marls	S.A. ...	37	499	13·5	6	72	12·0	23½	373	15·9	...	...	...
	No S.A. ...	11	151	13·7	15	130	8 7	5	68	13 6	...	...	...
	Total ...	48	650	13 5	21	202	9 6	28½	441	15·5	...	...	...
Marls and Calcareous Clay Tuff	S.A. ...	4	57	14·2	7	98	14·0	..	...	..	...	.	...
	No S.A. ...	...	...	...	..	...	...	...	..		...	...	...
	Total ..	4	57	14·2	7	98	14·0	..	..	...	...	...	...
Calcareous Clay Tuff	S.A. ...	21	302	14 4	23	272½	11·9	22	240	10·9	...	...	...
	No S.A. ...	84¼	899	10·7	8	130	16 3	10	60	6	11½	102	8·9
	Total ...	105¼	1,201	11 4	31	402½	13·0	32	300	9·4	11½	102	8·9
Non-Calcareous Clay Tuff	S.A. ..	...	...	...	...	...	...	...	...	...	...	...	...
	No S.A. ...	6½	25	3·8	...	...	...	5	28	5·6	9	80	9·9
	Total ...	6½	25	3·8	...	...	...	5	28	5·6	9	80	8·9
Gritty Tuff	S.A. ...	40	356	8·9	...	...	...	...	...	...	...	...	...
	No S.A. ...	...	..	...	...	...	...	...	..	..	...	...	..
	Total ...	40	356	8·9	...	...	...	...	...	...	..	...	...
Alluvial Soils	S.A. ...	49½	657	13·3	...	...	...	...	...	...	...	...	...
	No S.A. ..	32	249	7·8	...	..	...	...	...	...	...	...	...
	Total ...	81½	906	11·1	...	...	.	...	...	...	...	...	...

General discussion of Yield data.

If in any soil group we omit mean yields derived from a smaller area than 20 acres we get the following general results. On the dry North and North East marl soils there is little difference between B.H.10.12, Ba.11569 and P.O.J. 2878 as plant cane, all three being slightly better than B.147 (B.4507). As a ratoon cane on these soils B.H.10.12 is inferior to Ba.11569, B.147 (B.4507) and P.O.J.2878.

On the mixed marl and lagoon clay soils there again appears to be little difference between B.H.10.12, Ba.11569 and B.147 (B.4507) as plant cane. The ratoon acreages of B.H.10.12 taken separately as 1st and as 2nd ratoons on this type of soil are both below 20 acres. If we combine first and second ratoons and compare with the combined first and second ratoons of B.147 (B.4507) we find that the latter is superior to B.H.10.12.

On the lagoon clay soils B.H.10.12 is inferior to Ba.11569 as a plant cane.

On the central marls B.H.10.12 appears to be superior to Ba.11569 and P.O.J.2878 as a plant cane. The data for ratoons are derived from small acreages but B.H.10.12 appears to be superior to Ba.11569 and not quite as good as B.147 (B.4507). On calcareous clay tuffs B.H.10.12 has yielded as a plant cane the same as Ba.11569 and slightly better than P.O.J.2878. As a ratoon it is inferior to Ba.11569.

On non calcareous clay tuff it has been inferior to Ba.11569 as a plant cane. Adequate ratoon data are not available.

In general we may state of the standard varieties that Ba.11569 and B.147 (B.4507) are more suited for cultivation on the marl soils of the dry districts especially in view of their ratooning powers. B.H.10.12 does well on the marl soils of the wetter districts both as plant cane and as a ratoon.

On the lagoon clays Ba.11569 is probably the most satisfactory variety so too on the non calcareous clay tuffs.

B.H.10.12 does well on the calcareous clay tuffs but as a rule is inferior to Ba.11569 in the ratoon crops.

P.O.J.2878 does not excel on any soil type although it is probable that in a year of unusually heavy rain well distributed it would beat all other varieties if planted early.

EFFECT OF SULPHATE OF AMMONIA ON RATOON YIELDS.

Soil Type	First Ratoons. S. A. Acres.	Tons.	Mean yield.	No S. A. Acres.	Tons.	Mean yield.	Second Ratoons. S. A. Acres.	Tons.	Mean yield.	No S. A. Acres.	Tons.	Mean yield.
N & N.E. marls	261¾	4,466	17·1	125½	1,801	14·4	204½	3,036	14·8	250	2,585	10·3
Mixed marls and Lagoon clay ...	101	1,189	11·75	4	60	15 0	29	256	8·8	71	641	9·2
Lagoon clay							37½	389	10·4	24	172	7·2
Central marls							66½	944	14·2	31	349	11·2
Calcareous clay tuff	82½	1,323	16.0	49½	402	8·1	66	814½	12·3	102½	1,089	10·7
Non-calc. clay tuff	24	410	17·1	51½	359	7·0						
Gritty tuff	9	101	11·2	46	479	10·4						
Alluvial soils ...							49½	657	13·3	32	249	7·8
Total ...	478¼	7,489	15·7	276½	3,101	11·3	453	6,096½	13·4	510½	5,085	9·98

In the above table yield data are given only from those soil types in which fields both with and without sulphate of ammonia treatment are to be found.

1936 Crop.

Plant Canes for 1936. Acreages under Different Varieties.

Variety.	B.H. 10·12.	Ba. 11569.	P.O.J. 2878.	B. 147 (B. 4507	Mixed.	B. 6308.	Co 213.	B. 726.	S.C. 12·4.	B 4596.	B. 2935.	Miscellaneous.	Tota
Acreage	1,086	700·75	620·25	264·5	134·25	70	39·75	39·75	35	28·25	25·5	8	3,052
% of Reported Acreage	35·7	23·0	20·2	8·6	4·4	2·4	1·3	1·3	1·2	0·9	0·8	0·2	100

The following table shows the relative areas planted under the four standard varieties for the seasons 1934, 1935 and 1936.

RELATIVE AREAS UNDER STANDARD VARIETIES 1934–1936.

	B.H.10.12	Ba11569	B. 4507 (B. 147)	P.O.J. 2878
For 1934	37.2%	14.0%	26.0%	9.3%
„ 1935	43.6%	21.5%	9.9%	10.4%
„ 1936	35.7%	23.0%	8.6%	20.2%

The most noteworthy changes are (i) the increase in the area under Ba.11569 since 1933. (ii) the increase in the area under P.O.J.2878 since 1934, and (iii) the decrease in the area under B.147 (B.4507) since 1933. Of these changes No. (i) is probably very well advised but it is doubtful if it has been advisable to extend P.O.J.2878 to such an extent as has been the case. The cultivation of B.147 (B.4507) on soils with poor drainage is definitely inadvisable but it is an admirable cane on light limestone soils and cannot satisfactorily be replaced on these soils by P.O.J.2878. Its bad reputation for difficulty of establishment in the past has no doubt accounted largely for restriction of its cultivation. It can be readily established in October if the setts are soaked in saturated lime water for 48 hours before planting.

The following tables show respectively the manurial treatment given the fields prepared for the 1936 crop and the method of cultivation.

MANURIAL TREATMENT.

	Pen Manure	Fish Manure	Sheep Manure	Filter Press Mud	Ashes	No Manure	Total.
Acres	1739.75	63	110.5	251.25	1	887	3,052
%	57.1	2.0	3.6	8.2	0.1	29.0	100

METHOD OF CULTIVATION.

	Gyrotiller		Cattle Plough		Tractor Plough		Total.
	Flat	Banked	Close Ploughed	Other	Flat	Banked	
Acres	383¼	332	138¼	2,122½	32	44	3,052
%	13	10.9	4.5	69	1.1	1.5	100

EXPERIMENTS WITH SUGAR CANE.

1. Experiments in connection with the germination of sugar cane.

In some parts of Antigua considerable difficulty in establishing fields of plant cane is frequently experienced as a result of irregularities in germination. Soaking the cuttings in water or in lime water has been advocated and at times the practice has proved of value while on other occasions no benefits have resulted.

Experiments with the varieties B.891 and B.726 unsoaked, soaked in water, in lime water, in ½% solution of ferrous sulphate and in lime water with magnesium sulphate have been conducted in Barbados * during the period 1930-1933.

Under dry conditions B.891 cuttings soaked for forty eight hours in ferrous sulphate solution or in lime water germinated better than when soaked in water alone or in lime water with magnesium sulphate, both of which treatments in turn gave better germinations than the unsoaked cuttings.

Under wet conditions the cuttings soaked in water alone showed a significantly slightly lower germination than those from the other four treatments. There was no significant difference between the germinations in cuttings from these four treatments. Under wet conditions B.726 germinated well with all treatments, but treatment with ½% ferrous sulphate did not give quite so high a percentage germination as the others.

Germination trials have also been conducted in Mauritius ** with White Tanna and with B.H.10/12. The former variety was soaked for 24 hours and the latter for eight hours. In both cases all treatments gave good germina-

* Dept. of Science & Agriculture, Barbados. Agricultural Journal Vol. 2 No. 3 pp. 20—25.

** Third Annual Report of the Sugar Cane Research Station. Department of Agriculture, Mauritius pp. 45-66.

tions. Soaking in lime water and soaking in water alone however greatly increased the speed of germination and the final germination figures were slightly higher than in the case of unsoaked cuttings.

C. F. Charter * has shown that the germination of cane cuttings especially in the case of B.147 (B.4507)—a variety generally recognised as one established only with difficulty—can be greatly increased and accelerated by soaking for 48 hours in saturated lime water.

Two experiments have been conducted at Greencastle Experiment Station to determine the effect on germination both under wet and under dry conditions of soaking for 48 hours (a) in water (b) in lime water the varieties B.H.10/12, B.147 (B.4507), Ba.11569 and P.O.J.2878—the four varieties most extensively cultivated in Antigua.

In each case the lay out was six randomised blocks—the individual plots consisting of two rows containing 24 setts per row. The setts were all planted flat and spaced one foot apart.

The "wet planting" experiment was planted 13/12/34. The rainfall during November and December 1934 and January 1935 was 11.48 ins., 6.60 ins. and 3.94 ins. respectively.

Table I shows the final germination figures for this experiment two months after planting.

Table I. Wet Season Germination Experiment.

Block.	B.H. 10.12			B.147 (B.4507)			Ba. 11569			P.O.J. 2878		
	Not Soaked	Water.	Lime Water.	Not Soaked.	Water.	Lime Water.	Not Soaked.	Water.	Lime Water.	Not Soaked.	Water.	Lime Water.
A	37	37	41	27	38	46	46	31	44	37	29	32
B	41	34	42	26	37	46	38	30	43	28	21	37
C	37	38	43	19	31	45	41	39	43	37	25	36
D	36	27	46	32	34	47	41	36	42	28	19	34
E	41	25	47	28	38	47	42	35	42	29	23	32
F	34	38	42	25	26	46	41	34	45	39	10	35
Total	226	199	261	157	204	277	249	205	259	198	127	206
Mean	37·7	33·1	43·5	26·2	34·0	46·2	41·5	34·2	43·2	33·0	21·0	34·3
%	78·5	69·2	90·7	54 5	70·8	96·0	86·5	71·2	90·0	68·8	44·2	71·5
	Significant Difference %			Significant Difference %			Significant Difference %			Significant Difference %		
	12·6 Prob. ·05			11·9 Prob. ·01			9·9 Prob ·01			20 Prob. ·01		

In the case of each variety the germination of the cuttings soaked in lime water has been better than that of the unsoaked cuttings although a significant difference has been proved only in the case of B.147 (B.4507)

In each case lime water treatment is significantly better than water treatment.

* Unpublished comunication.

Soaking B.147 (B.4507) in water has given a significantly greater germination than that obtained with unsoaked cuttings. In the case of Ba.11569 and P.O.J.2878 water soaking has significantly depressed germination.

Lime water treatment has also accelerated germination especially in the case of B.147 (B.4507). This is shown in the following table which contains mean germination figures at 18 days and 25 days after planting.

Time.	B.H. 10.12			B.147 (B.4507)			Ba. 11560			P.O.J. 2878		
	Not Soaked.	H_2O	Lime Water.	Not Soaked.	H_2O	Lime Water.	Not Soaked.	H_2O	Lime Water.	Not Soaked.	H_2O	Lime Water.
18 days	27	21	32	1	17	28	13	15	22	7	10	20
25 days	35	27	39	8	26	42	28	29	38	18	17	32

The planting material used in the experiment was obtained from plant canes: the respective ages were:—

B.H.10/12	7 months
B.147 (B.4507)	11 „
Ba.11569	9 „
P.O.J.2878	12 „

The "dry planting" experiment was planted 16/3/35. The rainfall during February, March and April 1935 was 1.89 ins., 1.18 ins., and 2.45 ins. respectively.

Table II shows the final germination figures for this experiment 7 weeks after planting.

TABLE II. DRY SEASON GERMINATION EXPERIMENT.

Block	B.H. 10.12			B.147 (B.4507)			Ba. 11569			P.O.J. 2878		
	Not soaked.	Water.	Lime Water.	Not soaked.	Water.	Lime Water.	Not soaked.	Water.	Lime Water.	Not soaked.	Water.	Lime Water.
A	35	19	13	36	15	4	39	15	40	41	25	35
B	42	6	30	35	28	18	32	33	21	36	32	30
C	12	17	30	26	21	15	28	27	33	22	16	30
D	37	19	21	32	13	14	34	19	36	34	25	33
E	24	11	33	35	23	10	38	4	37	36	29	30
F	38	3	33	37	21	28	41	20	47	38	25	32
Total	188	75	160	201	121	99	212	118	214	207	152	190
Mean	31·3	12·5	26·7	33·5	20·1	16·5	35·3	19·7	35·7	34·5	25·3	31·3
%	65·3	26·1	55·6	69·8	41·9	34·3	73·7	40·9	74·1	71·8	52·8	65·9
	Significant Difference %			Significant Difference %			Significant Difference %			Significant Difference %		
	28·2 Prob. ·05			7·5 Prob. ·01			24·5 Prob. ·05			11·3 Prob. ·05		

In every case soaking in water has significantly decreased the germination percentage and in the case of B.147 (B.4507) lime water treatment has resulted in a greater reduction than soaking in water alone. In no case has soaking in lime water proved beneficial.

The planting material used in this experiment was obtained from plant cane. The respective ages of the varieties were:—

B.H.10/12	14 months
B.147 (B.4507)	16 „
Ba.11569	14 „
P.O.J.2878	14 „

On repeating a germination trial with B.147 (B.4507) in April 1935 during wetter weather, lime water soaking again caused increased germination, viz, soaked 98% unsoaked 69%.

As a possible explanation of the anomalous behaviour of B.147 when planted under dry conditions it has been suggested that the dryness of the soil at the time of planting and for some time after was more injurious to plants which started to germinate as the result of soaking in lime water than to plants which germinated more slowly without this treatment.

Considerable increases in germination followed lime water treatment of B.726 and B.891—ratoon cane material—planted under wet conditions. The final germination counts were as follows:—

B.726 untreated 25.8% B.891 untreated 16.9%
B.726 lime water treatment 88.3%. B.891 lime water treatment 79.4%.

The above experiments indicate that under wet conditions germination is stimulated by soaking for 48 hours in saturated lime water but that under dry conditions this treatment can produce the reverse effect.

Soaking in water alone save in the case of B.147 has had an injurious effect and it is suggested in view of this fact that failure to obtain increased germination on soaking in lime water and planting under wet conditions may at times have been due to the use of poor lime—the soaking liquid being essentially a suspension of insoluble calcium carbonate rather than a solution of calcium hydroxide.

II. Varietal Experiments.

(A) Experiments with first ratoons.

Certain of the experimental plots reaped as plant canes in 1934 were reaped as first ratoons during the season under review.

The following tables show the stations at which the ratoon experiments were reaped, the varieties cultivated at each station and the yields per acre in tons cane. For purposes of comparison each table also shows the yields in tons cane per acre of the plant canes and also the total yield of each variety for the two crops.

Variety Trial. Parrys.
Soil Type. Deep Calcareous.
Reaped as plant cane 17.3.34. Reaped as first ratoons 2.4.35.
Rainfall. 44 ins.

First Ratoons.		Plant Cane.		Two Crops.	
Variety	Tons cane per acre	Variety	Tons cane per acre	Variety	Tons cane per acre
B.726	27.0	G.119	54.9	G.119	76.4
P.O.J.2878	25.8	B.891	51.3	B.726	75.5
B.891	22.4	B.726	48.5	B.891	73.7
G.119	21.5	B.374	45.1	P.O.J.2878	70.5
B.3922	18.7	P.O.J.2878	44.7	B.374	63.1
B.374	18.0	B.6308	37.0	B.3922	54.8
B.6308	12.2	B.3922	36.1	B.6308	49.2

Variety Trial. Yorkes.
Soil Type. Alluvial.
Reaped as plant cane 21.3.34. Reaped as first ratoon 8.3.35.
Rainfall. 35 ins.

First Ratoons.		Plant Cane.		Two Crops.	
Variety	Tons cane per acre	Variety	Tons cane per acre	Variety	Tons cane per acre
P.O.J.2878	15.9	P.O.J.2878	32.0	P.O.J.2878	47.9
B.726	12.9	B.726	28.1	B.726	41.0
B.891	11.0	B.4507	27.8	B.891	38.0
B.374	10.5	B.891	27.0	B.374	37.2
Co. 213	10.1	B.374	26.7	B.4507	37.1
B.4507	9.3	B.6308	24.3	Co.213	33.3
B.6308	7.5	Co.213	23.2	B.6308	31.8

Variety Trial. The Cotton.
Soil Type. Calcareous.
Reaped as plant canes 27.4.34. Reaped as first ratoons 29.3.35.
Rainfall. 34 ins.

First Ratoons.		Plant Cane.		Two Crops.	
Variety	Tons cane per acre	Variety	Tons cane per acre.	Variety	Tons cane per acre.
P.O.J.2878	25.2	P.O.J.2878	38.7	P.O.J.2878	63.9
Ba.11569	24.2	B.891	34.9	Ba.11569	58.9
B.891	21.1	Ba.11569	34.7	B.891	56.0
B.726	17.1	B.374	32.2	B.374	47.4
G.119	15.6	G.119	31.4	G.119	47.0
B.374	15.2	B.726	27.2	B.726	44.3
B.4507*	11.2				

Variety Trial. Tomlinsons.
Soil Type. Non calcareous clay tuff (saline).
Rainfall. 42.60 ins.
Reaped as plant canes 27.2.34. Reaped as first ratoons 4.3.35.

First Ratoon.		Plant Cane.		Two Crops.	
Variety	Tons cane per acre.	Variety	Tons cane per acre	Variety	Tons cane per acre
P.O.J.2878	12.5	Co.213	23.8	Co.213	35.8
Co.213	12.0	P.O.J.2878	20.9	P.O.J.2878	32.9

* B.4507 as plant cane was so badly suppressed by more quickly growing varieties that the yield was not recorded.

At Tomlinsons Co.213 and P.O.J.2878 were the only varieties which ratooned sufficiently well to be worth weighing.

As already indicated in the report for 1934 the lay out was one of eight randomised blocks, the individual plots consisting of two rows containing 20 or 30 stools and separated from each other by single rows of the standard. The lay out has not proved very satisfactory chiefly owing to suppression of the standard when planted alongside P.O.J.2878 or some other vigorous variety.

(B) Experiments with Plant Cane.

These experiments together with the cultural and manurial experiments in subsequent sections of the report form part of a comprehensive series of experiments conducted by this Department and by the agronomist of the Gunthorpes Estates under the direction of Mr. P. E. Turner—Adviser in Sugar Cane Experiments to the Commissioner of Agriculture—and under the auspices of the Sugar Cane Investigation Committee of Antigua.

The preliminary results of this experimental scheme have been published in Tropical Agriculture.*

Variety Trial. Thibous.

Soil Type. Calcareous marl, shallow phase.

Planted. 20/12/33. Reaped 28/2/35.

Rainfall. December 1933	2.72 ins.	Average rainfall for similar period		
1934	33.75 ins.	based on returns for 10 years.		
January — February 1935	1.54 ins.	December	2.77 ins.	
		January-December ..	36.40 ins.	
		January-February ..	2.89 ins.	
Total	38.01 ins.	Total	42.06 ins.	

Lay out. Five randomised blocks. Plot size 1/32 acre.

Variety	Yield Tons per acre Cane	Sugar	Sucrose in Juice lb. per gal.
Ba. 11569	17.17	2.35	2.036
B.2935	16.10	2.26	2.096
P.O.J.2878	13.11	1.64	1.799
S.C.12.4	10.65	1.33	1.862
B.147 (B.4507)**	7.73	0.90	1.713

All the varieties with the exception of B.147 germinated well and were established without difficulty.

Differences between mean yields of cane exceeding 5.62 tons are statistically significant. The yield of Ba.11569 is significantly greater than that of S.C. 12/4 and of B147. The yield of B.2935 is significantly greater than that of B.147.

A difference of 0.76 tons of sugar per acre is necessary for statistical significance. The varieties Ba.11569 and B.2935 give significantly larger yields of sugar to the acre than S.C.12.4 and B.147.

* Jany. & Feby. 1936.

** There has long been uncertainty as to whether or not the two varieties cultivated in Antigua as B.147 and B.4507 were really two varieties or not. It seems probable that only one variety is cultivated, viz. B.147.

Varietal Trial. Collins.

Soil Type. Calcareous marl.

Planted. 28/12/33. Reaped 12/3/35.

Rainfall.			Average rainfall for similar period based on returns for 10 years.	
Dec.	1933	2.12 ins.	Dec.	2.93 ins.
	1934	40.08 „	Jan.-Dec.	38.31 „
Jan-Feb.	1935	2.14 „	Jan.-Feb.	3.32 „
Total		44.34 „	Total	44.56 „

Lay out. Four randomised blocks. Plot size 1/30 acre.

Variety	Yield tons per acre		Sucrose in juice lb. per gal.
	Cane.	Sugar.	
B.2935	28.59	3.47	1.820
Ba.11569	28.08	3.70	1.950
B.H.10.12 ..	26.30	3.84	2.181
P.O.J.2878 ..	25.24	3.61	2.135
S.C.12.4	22.54	3.20	2.114
B.147 (B.4507) ..	22.28	2.79	1.854
B.726	22.11	3.41	2.309

The varieties B.147 and S.C.12.4 were difficult to establish and made a poor start. B.2935 germinated well, but subsequently a number of the young plants in one plot were killed by weevil borer.

Differences between two mean yields of cane exceeding 4.79 tons per acre are statistically significant. The yields of B.2935 and Ba.11569 are significantly greater than those of S.C.12.4, B.147 and B.726.

A difference of 0.49 tons of sugar per acre is necessary for statistical significance. The variety B.H.10.12 rises from third place to first place when allowance is made for juice quality.

Varietal Trial. Paynters.

Soil Type. Non-calcareous clay tuff.

Planted. 9/1/34. Reaped 21/3/35.

Rainfall.			Average rainfall for similar period based on returns for 10 years.	
Dec.	1933	3.71 ins.	Dec.	3.00 ins.
	1934	46.41 „	Jan.-Dec.	39.93 „
Jan-Mch.	1935	4.06 „	Jan.-Mch.	5.07 „
Total		54.18 „	Total	48.00 „

Lay out. Four randomised blocks. Plot size 1/30 acre.

Variety	Yield tons per acre		Sucrose in juice lb. per gal.
	Cane.	Sugar.	
B.2935	32.96	4.57	2.059
Ba.11569 ..	30.48	4.18	2.041
P.O.J.2878 ..	29.70	3.93	1.973
S.C. 12.4 ..	29.37	4.18	2.124
B.H.10.12 ..	26.95	4.35	2.332
B.726 ..	26.30	3.97	2.254
B.147 (B.4507) ..	25.25	3.05	1.794

In this experiment B.H.10.12 was not properly established until after supplying.

A difference between any two mean yields of cane must exceed 3.66 tons per acre for statistical significance. The yield of B.2935 is significantly greater than those of B.H.10.12, B.726 and B.147. The yield of Ba.11569 are significantly greater than those of B.726 and B.147, while P.O.J.2878 and S.C.-12/4 are significantly better than B.147.

A difference of 0.56 tons per acre is necessary for statistical significance. B.2935 is significantly better than B.726 and B.147. B.147 is significantly poorer than the other varieties.

The following general comments on the varieties under comparison may be of interest.

*Ba.*11569 and *B.*2935 have done well in the experiments. The former cane despite poor germination at times and only moderately good juice qualities appears to be the nearest approach of the established varieties to a general purpose cane in Antigua. In most fields it shows leaf symptoms of gumming disease but is sufficiently resistant to this disease to warrant general planting until a more suitable variety is forthcoming.

B.2935 germinates readily and is likely to compete with Ba.11569 on many soils provided it ratoons well.

*P.O.J.*2878 germinates well. In all these experiments it made the most rapid early growth but ultimately gave place to other varieties. It is unsuited to conditions of low rainfall.

*B.H.*10.12 requires an annual rainfall exceeding 40 inches and a well drained soil. Under these conditions it is capable of giving satisfactory yields of cane and of sugar.

*S.C.*12.4 has not done particularly well in any of the trials. General field experience in Antigua indicates that except in limited localities it is not suited to Antigua conditions.

*B.*726 germinated fairly well but has given poor results in the trials here reported. Field experience indicates that it is well suited to conditions in the Bendals and Jolly Hill districts.

*B.*147 has given poor results in the three trials. Field experience, however, indicates that it is a valuable cane on the marl soils especially in virtue of its drought resistance and good ratooning power. Its germination is uncertain and its early growth slow, two drawbacks which can be overcome by soaking the setts in lime water and by earlier planting respectively.

III. Manurial and Cultural Experiments.

(A.) Optimum Size of Dressing of Pen Manure and Pen Manure v. Sulphate of Ammonia (plant canes).

Estate: Gaynors.
Soil Type: Calcareous marl.
Rainfall: (14½ months) 35 ins. Variety: Ba.11569.
Layout: Two 4 x 4 Latin squares and Four Randomised Blocks.
Plot size: 1/36 acre.
Planted: 8.2.34. Manured: 5.7.34. Reaped: 16.4.35.

Treatment.	Yield (tons per acre).	Gain in yield (tons per acre)
No manure	26.56	—
12 tons pen manure per acre.	32.65	6.09
24 tons pen manure per acre.	34.62	8.06
4 cwt. Sulphate of ammonia per acre. 2 cwt. 12.7.34. 2 cwt. 31.8.34.	26.90	0.34

The pen manure used in this experiment was of excellent quality and far superior to the average product. It was applied in the furrows between the stools of cane.

The gain in yield due to pen manure is statistically significant and might be due to chance far less than once in 100 times.

There was practically no gain in yield from the sulphate of ammonia: the small difference observed is not significant.

The results of this experiment indicate that as far as the plant canes are concerned it would be preferable to apply pen manure to the whole area cultivated at the rate of 12 tons per acre than to apply a larger dressing to portion of the area and to leave the remainder without pen manure.

(B). Optimum Size of Dressing of Filter-Press Mud and Filter-Press Mud v. Pen Manure (plant canes).

Estate: Yeamans.

Soil Type: Calcareous marl.

Rainfall: (13 months) 41 inches. Variety: Ba.11569.

Layout: Two 5 x 5 Latin squares. Plot size: 1/29 acre.

Planted: 2.3.34. Manured: 10.7.34. Reaped: 5.4.35.

Treatment	Yield (tons per acre)	Gain in yield (tons per acre)
No Manure	31.76	—
3 tons filter press mud per acre	35.73	3.97
6 tons filter press mud per acre	36.33	4.57
9 tons filter press mud per acre	37.12	5.36
10 tons pen manure per acre	35.57	3.87

The filter press mud and the pen manure were applied in the furrows between the cane stools. The pen manure was of average quality.

The gains in yield due to filter press mud and pen manure are statistically significant and might be due to chance less than once in 100 times. About 3 tons filter press mud per acre appears to be the economic application and equals about 10 tons pen manure of average quality.

(C). Sulphate of Ammonia on plant canes growing on soil which has not received pen manure.

Estate: Betty's Hope. (1.6% $CaCO_3$

Soil Type: Lagoon clay.

Rainfall (14¾ months): 42 inches. Variety: Ba.11569.

Layout: 7 Randomised Blocks. Plot size: 1/25 acre.

Planted: 22.12.33. Reaped: 16.3.35.

Treatment. Sulphate of Ammonia per acre		Yield	Gain in Yield
March 1934	Aug-Sept. 1934	Tons per acre	Tons per acre.
Nil	Nil	29.40	
Nil	2 cwt	32.42	+3.02
Nil	4 cwt	32.31	+2.91
2 cwt	2 cwt	28.78	—0.62
2 cwt	4 cwt	29.90	+0.50

Late dressings of Sulphate of Ammonia have produced a gain in yield of 3 tons per acre. This increment though small is significant.

Estate: Yorkes.
Soil Type: Non-calcareous.
Rainfall, (11 months): 35 inches. Variety B.H. 10.12.
Layout: Two 5 x 5 Latin Squares. Plot size: 1/24 acre.
Planted: 7.4.34 Reaped: 7.3.35.

Treatment. Sulphate of Ammonia per acre		Yield	Gain in Yield
April 1934	Aug–Sept. 1934	Tons per acre	Tons per acre.
Nil	Nil	11.85	
Nil	2 cwt	12.40	+0.55
Nil	4 cwt	12.25	+0.40
2 cwt	2 cwt	11.95	+0.10
2 cwt	4 cwt	12.50	+0.70

In no case is the increase in yield significant. The experimental field was cultivated during the wet season of 1933 and was in somewhat poor tilth. The rainfall 35 inches during the growing period was badly distributed 15.79 inches falling during November and December. The possible significance of these factors will be discussed later.

Estate: Jolly Hill.
Soil type: Alluvial. Non-calcareous.
Rainfall (16 months): 42.73 inches. Variety: B.H.10.12.
Layout: One 6 x 6 Latin square. Plot size: 1/30 acre.
Planted: 6.1.34 Reaped: 2.5.35.

Treatment Sulphate of Ammonia per acre			Yield	Gain in Yield
	March	August	Tons per acre	Tons per acre
Banks broken ..	Nil	Nil	16.35	
„ „ ..	2 cwt.	2 cwt.	18.10	+1.75
„ „ ..	Nil	2 cwt.	15.90	—0.45
Banks not broken ..	Nil	Nil	18.00	
„ „ „ ..	2 cwt.	2 cwt.	16.45	—1.55
„ „ „ ..	Nil	2 cwt.	17.70	—0.30

The mean yield for the 12 no nitrogen plots was 17.2 tons per acre.
„ „ „ „ „ 12 2 cwt Sulphate of ammonia plots was 16.8 tons per acre.
„ „ „ „ „ 12 4 cwt Sulphate of ammonia plots was 17.4 tons per acre.
Sulphate of ammonia has not caused an increase in yield.

As was the case at Yorkes the field was cultivated in the rainy season of 1933 and was not in good tilth and the rainfall distribution was poor, nearly sixteen inches falling during November and December 1934.

Estate: Cochranes.

Soil Type: Calcareous clay tuff 8.3% C_aCO_3

Rainfall (12¾ months): 39 inches. Variety: Ba.11569.

Layout: One 6 x 6 Latin square. Plot size 1/23 acre.

Planted: 29.3.34. Reaped 23.4.35.

Treatment			Yield	Gain in Yield
Sulphate of Ammonia per acre			Tons per acre	Tons per acre
	August	October		
Banks broken ..	Nil	Nil	36.0	
„ „ ..	2 cwt.	2 cwt.	38.6	+2.6
„ „ ..	2 cwt.	Nil	38.4	+2.4
Banks not broken ..	Nil	Nil	37.5	
„ „ „ ..	2 cwt.	2 cwt.	36.1	+0.1
„ „ „ ..	2 cwt.	Nil	38.3	—1.2

The mean yield for the 12 No Nitrogen plots was 36.75 tons per acre.

The mean yield for the 12 2 cwt. Sulphate of ammonia plots was 38.35 tons per acre.

The mean yield for the 12 4 cwt. Sulphate of ammonia plots was 37.35 tons per acre.

The increments due to sulphate of ammonia are very small and are not statistically significant.

The effect of Breaking of Banks in the two experiments above will be discussed in a later section of this report.

(D). Sulphate of Ammonia V. Nitrate of Soda on plant canes growing on soil which has not received pen manure.

Estate: Parham Lodge.

Soil type: Calcareous marl, deep phase. 24% C_aCO_3

Rainfall (15 months): 49 inches. Variety: Ba.11569.

Layout: Two 5 x 5 Latin squares. Plot size: 1/24 acre.

Planted: 29/12/33. Reaped: 27.3.35.

Treatment.		Yield.	Gain in Yield.
Applied in June.	Applied in August.	Tons per acre.	Tons per acre.
Nil.	Nil.	27.83	
42 lb. N. as Sulphate of ammonia. ..	Nil.	26.80	—1.03
42 lb. N. as N_aNO_3	Nil.	25.85	—1.95
42 lb. N. as Sulphate of ammonia. ..	42 lb. N. as Sulphate of ammonia. ..	26.74	—1.09
42 lb. N. as N_aNO_3	42 lb. N. as N_aNO_3	26.89	—0.94

The decreases are not significant.

Estate: Ffryes.

Soil Type: Calcareous. 16.4% C_aCO_3

Rainfall (13¾ months): 40 inches. Variety: B.H.10.12.

Layout: Two 5 x 5 Latin Squares. Plot size: 1/30 acre.

Planted: 15/2/34. Reaped: 10/4/35.

Treatment.		Yield.	Gain in Yield.
Applied in June.	Applied in August.	Tons per acre.	Tons per acre.
Nil.	Nil.	21.71	
42 lb. N. as Sulphate of ammonia. ..	Nil.	22.26	+0.55
42 lb. N. as N_aNO_3	Nil.	21.20	—0.51
42 lb. N. as Sulphate of ammonia. ..	42 lb. N. as Sulphate of ammonia. ..	19.87	—1.84
42 lb. N. as N_aNO_3	42 lb. N. as N_aNO_3	20.30	—1.41

Average Yield No Nitrogen plots .. 21.71 tons per acre.
„ „ 42 lb. „ „ .. 21.73 „ „ „
„ „ 84 lb. „ „ .. 20.09 „ „ „

The average yield on the high nitrogen plots is significantly smaller than on the plots without nitrogen and with 42 lb. nitrogen.

(E). Sulphate of Ammonia on First Ratoons.

Estate: Blubber Valley.

Soil type: Alluvial. Non-calcareous.

Rainfall (13½ months): 38 inches. Variety: B.H.10.12.

Layout: One 4 x 4 Latin square and 4 Randomised Blocks.

Plot size: 1/24 acre.

Reaped as plant canes: 23/3/34. Manured: 15/5/34. Reaped: 7/5/35.

Treatments. Sulphate of Ammonia per acre.	Yield. Tons per acre.	Gain in Yield. Tons per acre.
Nil.	10.33	
2 cwt.	14.98	4.65
4 cwt.	16.58	6.25
6 cwt.	17.08	6.75

Pen manure (quantity unknown) was applied to the field as plant cane.

The gains in yield due to Sulphate of ammonia are significant and might be due to chance far less than once in 100 times.

Estate: Diamond.

Soil type: Calcareous marl, deep phase. 29.7% C_aCO_3

Rainfall (13 months): 43 inches. Variety: B.H.10.12.

Layout: Four 4 x 4 Latin squares. Plot size: 1/31 acre.

Reaped as plant cane: 20/3/34. Manured 17/5/34. Reaped 28/4.35.

Treatments. Sulphate of Ammonia per acre.	Yield. Tons per acre.	Gain in Yield. Tons per acre.
Nil.	14.65	
2¼ cwt.	16.03	1.38
4½ cwt.	17.76	3.11
6¾ cwt.	18.21	3.56

No manure was applied to this field as plant canes. The gains in yield due to sulphate of ammonia although small are definitely significant and might be due to chance less than once in 100 times.

(F). Sulphate of Ammonia V. Nitrate of Soda on First Ratoons.

Estate: La Roches. Field No. 3.

Soil type: Slightly calcareous clay tuff. 1.1% C_aCO_3

Rainfall (11½ months): 39 inches. Variety: Ba.11569.

Layout: Four 4 x 4 Latin squares. Plot size: 1/29 acre.

Reaped as plant canes: 12/6/34. Manured 10/7/34. Reaped: 21/5/35.

Treatments.	Yield. Tons per acre.	Gain in Yield. Tons per acre.
No manure (mean of 32 plots)	21.03	
60 lb. N. as sulphate of ammonia	28.00	6.97
60 lb. N. as N_aNO_3	27.28	6.25

25 tons pen manure was applied to the field as plant cane. The increments due to nitrogen are highly significant and are economic. There is nothing to choose between sulphate of ammonia and nitrate of soda.

Estate: Fitches Creek. No 5.

Soil type: Calcareous marl, deep phase. 15.3% C_aCO_3

Rainfall (13½ months): 50 inches. Variety: B.147 (B.4507).

Layout: Four 4 x 4 Latin squares. Plot size: 1/30 acre.

Reaped as plant canes: April 1934. Manured 11/7/34. Reaped: 28/5/35.

Treatment.	Yield Tons per acre	Gain in Yield Tons per acre
No manure (mean of 32 plots)	24.54	
60 lb. N. as sulphate of ammonia	26.26	1.72
60 lb. N. as N_aNO_3	26.29	1.75

28 tons pen manure was applied to the field as plant cane.

The increments due to nitrogen are small but significant and might be due to chance less than once in 100 times.

(G). Cultural Experiments.

(*i*) *Breaking of Banks.*

It is not customary in Antigua deliberately to return the earth from the banks into the planting furrows during the life of the plant canes. In other countries it is claimed that this action is beneficial. The more important benefits may be summarised as follows:—

(1) The operation brings into closer proximity with the root system of the young plant the cultivated topsoil from which the banks are formed and the pen manure and decomposed trash which the banks contain.

(2) If the operation can be performed before the end of the wet season it provides an earth mulch around the base of the young plant which acts as a protective blanket during the dry weather which follows.

(3) It prevents water lying stagnant in the furrows or cross-holes around the base of the young plant in wet weather.

The experiments at Jolly Hill and at Cochranes have already been reported under the section dealing with the manurial effects of sulphate of ammonia on plant cane.

At Jolly Hill the mean yield of 18 plots in which banks were broken was 16.78 tons per acre and of 18 plots in which the banks were left unbroken 17.40 tons per acre.

At Cochranes the mean yields were 37.64 tons per acre and 37.26 tons per acre respectively.

In neither experiment has the operation caused any significant difference in yield.

(*ii*) *Cross Holding V. Open Furrows*

Estate: La Roches.
Soil Type: Calcareous clay tuff.
Rainfall (13¼ months): 42 inches. Variety: Ba.11569.
Layout: Eight Randomised Blocks. Plot size: 1/29 acre.
Planted: 4.4.34. Reaped: 9.5.35.

Cultural Treatment.	Yield of Cane (Tons per acre).
Open Furrows	30.04
Cross Holed Furrows	28.72
Loss due to Cross holing	1.32

Each figure is the mean of sixteen plots but the difference of 1.32 tons in favour of open furrows cannot be established as statistically significant.

(*iii*). *Distance of Planting.*

Estate: Thibous. Big Piece.
Soil type: Calcareous marl, shallow phase.
Rainfall: (14¾ months): 38.01 inches. Variety: Ba.11569.
Layout: Four 3 x 3 Latin squares. Plot size: 1/30 acre.
Planted: 1.12.33. Reaped: 26.2.35.

Distance of Planting (Within rows)	Yield of Cane Tons per acre.
2 feet	17.28
3 feet	17.58
4 feet	16.47

There is no significant difference between yields, indicating that no gain results from planting closer than four feet within the row under the conditions of the experiment—small rainfall and uneven distribution—nearly 12 inches fell in November and December 1934.

In this experiment the distance between rows was kept constant at 4½ feet for all plots.

(H) Discussion of Results and Summary.

Significant gains in yield have followed the application of pen manure and of filter press mud to plant canes. In both experiments the manures were applied to the growing canes at the end of the dry season so that the effects produced would appear to be due to the actual fertilizing constituents of these manures rather than to conservation of moisture or improvement in tilth. The essential fertilizing constituents of pen manure are nitrogen phosphate and potash. In the case of filter press mud the chief fertilizing constituents are nitrogen and water soluble phosphate.

Neither sulphate of ammonia nor nitrate of soda caused any increment in yield when applied to plant cane except in the case of the experiment on the lightly calcareous soil at Betty's Hope where dressings of 2 or 4 cwt. sulphate of ammonia after the dry season caused small but significant gains.

It is generally stated as a result of field experience that sulphate of ammonia produces increases in yield on the non-calcareous soils of the Bendals and Jolly Hill Districts and it seems not improbable that in the case of the two experiments at Jolly Hill and Yorkes the poor rainfall, unevenly distributed and the poor tilth resulting from late cultivation have proved limiting factors preventing a response to nitrogen.

As regards ratoon canes large and significant gains in yield were obtained on the non-calcareous soil at Blubber Valley and on the feebly calcareous soil at La Roches while small but significant gains were obtained on the calcareous soils at the Diamond and at Fitches Creek.

If we accept the results with plant canes at Jolly Hill and at Yorkes as anomalous and caused by the factors mentioned above it will be observed that response to nitrogen is greatest on soils containing little or no calcium carbonate. This is in agreement with experimental results obtained in Trinidad where the response to nitrogen on naturally calcareous soils or on heavily limed soils can be very small unless ample available phosphate is present.

This theory that response to Nitrogen depends on the presence of available phosphate receives confirmation from the response to pen manure and to scum cake experienced on the calcareous soils at Gaynors and Yeamans.*

As regards the relative efficiency of sulphate of ammonia and nitrate of soda as sources of nitrogen the experimental results indicate that there is no advantage in one form over the other. Sulphate of ammonia is the cheaper fertilizer.

It is suggested that the failure of bank breaking to produce beneficial results may be due to the fact that the experiments were not planted until January and March respectively so that the plants were not sufficiently advanced in growth for the banks to be broken until the advent of the dry season. The mulching value during the dry season was therefore completely lost. The type of banking customary in Antigua in which the setts are planted in very deep furrows moreover makes breaking of banks a very difficult operation since the covering of the furrows with the very large volume of earth contained in the banks may cause a serious set back in growth to the young tillers. Tiller counts at Jolly Hill shortly after bank breaking showed in fact that the plots in which banks were unbroken contained on an average 31% more shoots than those in which banks were broken.

In the case of the cross hole v. open furrows experiment, the site was on rather heavier soil than is usually chosen for this operation. On the other hand the low rainfall at the time of planting and during early growth would in general be considered as propitious to the practice of cross holing. Neither increased germination nor better growth however resulted on the cross holed plots.

* A significant response to soluble phosphate in the presence of Nitrogen was obtained in an experiment conducted at Duers during the season 1930-1932. (Reports on the Agric. Dept., Antigua 1932-1933).

As regards planting distance the evidence so far available indicates that under dry conditions no advantage follows planting at a closer spacing in the rows than four feet.

A more detailed discussion of the results reported above will be found in the paper in Tropical Agriculture already quoted on page 25 which embodies not only the experiments conducted by this department but also those conducted by C. F. Charter, agronomist to the Gunthorpes Estates.

IV. Varietal Susceptibility to Moth Borer Attack.

Moth Borer infestation counts were made at the time of reaping the varietal experiments at Collins and at Paynters. An account of the relation between degree of infestation and field losses in the different varieties is being published in Tropical Agriculture*

The following table shows the varieties cultivated in the experiments at Collins and Paynters and the percentages of Stalk and of Joint Infestation.

Variety.	Collins. % Joint Infestation.	% Stalk Infestation.	Variety.	Paynters. % Joint Infestation.	% Stalk Infestation.
POJ.2878 ..	10.7	68.0	POJ.2878 ..	32.0	100.0
B.4507 ..	7.4	62.0	Ba.11569 ..	27.3	100.0
B.H.10.12 ..	7.3	62.5	B.726 ..	24.2	98.5
Ba.11569 ..	7.0	54.3	B.4507 ..	24.0	97.1
B.2935 ..	5.9	56.0	B.H.10.12 ..	22.9	98.2
B.726 ..	5.8	58.0	B.2935 ..	21.4	100.0
S.C.12.4 ..	4.3	42.5	S.C.12.4 ..	20.6	98.6

As a mean of the two experiments the varieties may be placed in the following increasing order of magnitude with respect to Percentage joint infestation:— S.C.12.4, B.2935, B.726, B.H.10.12, B.4507, Ba.11569, P.O.J.2878.

This order is somewhat different from that recorded in 1934 when B.4507 was less infested than the other standard varieties.

It seems probable that mean figures for a long period of years will be required to furnish even an approximately accurate estimate of varietal susceptibility.

COTTON SEED SELECTION.

The method followed in recent years of establishing a seed field on Thibous Estate with pedigree seed obtained from the Montserrat Agricultural Department, was again adopted in 1935. Eighty six pounds of seed were imported during 1935, the germination was good and the yield promised to be so high that seed from this field would probably be sufficient to plant about half of the acreage for the 1936-37 crop, the remaining acreage being planted with the Thibous No. 2 type, i.e. the seed obtained from cotton grown at Thibous for the 1935-36 crop not in the pedigree seed field but from seed from the preceding year's pedigree seed field.

By this system a fresh supply of pedigree seed is obtained annually for multiplication at Thibous and in the succeeding year the total acreage at Thibous (except the new pedigree seed field) is planted with the seed from this cotton and in addition as large an acreage elsewhere as is possible. The rest of the island's cotton acreage is planted with Thibous seed one generation further removed from the Montserrat pedigree seed.

* L. L. de Verteuil. Tropical Agriculture, May 1936.

The improvement in purity and in general quality resulting from the adoption of this system of seed selection has been maintained during the season under review.

Agricultural Education.

Monthly lectures to teachers in the primary schools were given by the agricultural superintendent, while the agricultural assistant on several occasions visited certain school gardens in districts where it was considered conditions allowed of the pupils carrying out the advice given.

Statistics.

A preliminary economic survey of Antigua with special reference to peasant agriculture was conducted by the Agricultural Assistant during November and December. The report is being replicated for local circulation.

Publications.

A preliminary note on the cultivation of Cauliflower in Antigua by L. L. de Verteuil, Agricultural Assistant, was published as a supplement to the Leeward Islands Gazette of the 5th September, 1935.

Correspondence.

During the year 136 minute papers were dealt with; 391 letters were received and 555 letters were despatched.

Official Visits.

Visits were paid to the Experiment Station by the following:—

His Excellency the Governor Lieut Colonel Sir Reginald St. Johnston, K.C.M.G., the Honourable H. E. Bader, Colonial Secretary, Mr. G. A. Jones, Dip. Agric., Commissioner of Agriculture, Mr. C. C. Skeete, B.A., Assistant Commissioner of Agriculture, Mr. P. E. Turner, M.Sc., F.I.C., Adviser in Sugar Cane Experiments to the Commissioner of Agriculture, Dr. H. R. Briton-Jones, Professor of Mycology and Bacteriology at the Imperial College of Tropical Agriculture and Mr. H. E. Box, F.E.S., Entomologist Advisory Department Imperial College of Tropical Agriculture.

In November a general meeting of the Antigua Agricultural and Commercial Society was held at the Experiment Station which was inspected by those present at the close of the meeting.

Acknowledgments.

Thanks are due to the Honourable A. E. Collins, F.I.C., F.C.S., Government Chemists for conducting analyses of cane juice and of manures in connection with the sugar cane experiments the results of which have been communicated in this report.

Thanks are also due to Mr. C. F. Charter, B.A., Agronomist to the Gunthorpes Estates for assistance and advice in connection with the detailed soil survey of the sugar cane areas which the Department is conducting.

Thanks are due also to Mr. S. Duncan of the I.C.T.A. who spent two months of the 1935 Long Vacation on voluntary work in this department.

SECTION III. FINANCIAL STATEMENT AND STAFF OF THE DEPARTMENT.

Expenditure.

Head VII.	£ s. d.	£ s. d.
Salaries	1371 5 0	
House Allowances	74 9 0	
Transport Allowances	232 3 1	
Greencastle & other experimental work ..	324 19 11	
Sugar Cane experiments	99 18 10	
Planting and maintaining trees ..	28 1 7	
Fumigation of plants	3 2 10	
Printing Reports and Contingencies ..	21 17 2	
Destruction of wild Cotton & Okra plants	5 0 6	
Distribution of Cotton Seed	Nil.	
Distribution of Paris Green	Nil.	
Preliminary Economic Survey ..	6 18 6	2167 16 5
Land Settlement Expenditure.		
(i) *General Expenditure*		
Land Officer's Department. Salary and Travelling	96 0 0	
Commissions on sale of land	27 15 0	
Stamps	1 3	
Refunds	2 12 10	126 9 1

(ii) *Agricultural Expenditure*

	Greencastle.	Matthews.	Jonas's.	
Supervision ..	12 0 0	12 0 0	12 0 0	
Planting material ..	10 4 3		31 2 0	
Drains and roads ..	4 9 3	1 4 5	5 8 6	
Moth Borer control	3 17 3			
Miscellaneous ..	16 10	18 8	1 0 6	
	31 7 7	14 3 1	49 11 0	95 1 8

Advances for Land Settlement Purposes		
Purchase of Fertilizers	65 1 2	
Land Settlement Cultivation	133 15 9	198 16 11
Deposits for Land Settlement Purposes		
Sale of Crops		
Sale of canes Greencastle	919 3 9½	
„ „ „ Matthews	464 1 10½	
„ „ „ Jonas's	337 7 5	1720 13 1
Advances other than Land Settlement		
Purchase of Vegetable Seed	11 10 10	
„ „ Onion Seed	11 13 0	23 3 10
Total		4332 1 0

Receipts.

Advances		
Land Settlement Cultivation	70 0 4	
Purchase of Fertilizer	104 3 1	
„ „ Vegetable seed	13 9 1	
„ „ Onion seed	15 19 11	203 12 5
Deposits		
Sale of Crops		
Sale of Produce of Experiment Station other than canes	59 10 3½	
Sale of canes Greencastle	1077 15 8½	
„ „ „ Matthews	515 10 11	
„ „ „ Jonas's	338 19 2	
	1991 16 1	
Less sums transferred to Advances for L.S. Cultivation and Purchase of Fertilizer	160 2 9	1831 13 4
Total		2035 5 9

The true Revenue of the Agricultural Department for the year was as follows:—

Revenue from Experiment Station ..	£110 10 7	
Profit on sale of Seeds	6 0 6	£116 11 1

STAFF OF THE DEPARTMENT.

Agricultural Superintendent	.. F. H. S. Warneford, M.A., B.Sc., A.I.C., F.C.S.
Agricultural Assistant ..	.. L. L. de Verteuil, D.I.C.T.A.
Junior Assistant	.. V. G. Pereira.
Assistant Clerk (Office) ..	.. G. L. Bellot.
Assistant Clerk (Field) ..	.. S. H. Abbott.
Cotton Inspector	.. R. L. V. Hall.
Foreman (Experiment Station)	.. R. E. M. Whyte.

The Agricultural Superintendent was on sick leave from July 22nd to July 29th. Mr. de Verteuil was on vacation leave from January 14th to January 19th and from December 16th to December 31st. Mr. Pereira was on vacation leave from August 21st to August 31st. Mr. Abbott was on sick leave from August 1st to August 10th, Mr. Hall from January 23rd to January 26th. The Foreman was on vacation leave from July 22nd to August 8th, and on sick leave from September 23rd to October 21st.

Mr. Hall continued to act as whole time Cotton Inspector.

SECTION IV. SUMMARY OF LEGISLATION AFFECTING ANIMALS, PLANTS, CROPS, ETC.

The summary published in the report for the period April to December 1931 remains unaltered save for the following amendments.

Animals.

S.R. & O. No. 20 of 1933 made under Sec. 18 of the Diseases of Animals Ordinance No. 16 of 1931 prohibits the landing of animals from Trinidad unless accompanied by a satisfactory veterinary certificate.

Cotton.

The Cotton Seed Control Ordinance No. 10 of 1932 prohibits the planting of any cotton seed other than that inspected and approved by the Agricultural Officer.

The Cotton Export Levy Ordinance No. 9 of 1933 provides for a levy on all cotton exported from the Presidency, the funds thus obtained being used for the purpose of furthering the interests of the cotton industry.

S.R. & O. No. 10 of 1934 made under Sec. 3 of the Cotton Export Levy Ordinance No. 9 of 1933 fixes the levy at the rate of $\frac{3}{8}$d. per lb.

The Cotton Export Ordinance No. 20 of 1934 makes provision for the regulation of the quantity of cotton exported from the Presidency.

Plants.

S.R. & O. No. 1 of 1935 made under Sec. 5 of the Plants Protection Ordinance No. 16 of 1923 fixes two schedules in connection with the importation of plants etc., articles in the first schedule being absolutely prohibited and those in the second schedule conditionally prohibited.

APPENDIX 1.

LAND SETTLEMENTS.

Greencastle. At the end of December 99 plots out of a total of 101 available were occupied, ninety-seven of these being arable plots and the remaining two a shop site and a pasture lot respectively.

There were no evictions during the year but two very unsatisfactory allottees were persuaded to transfer their plots to more suitable holders. There are still a few allottees who fail to cultivate their plots properly and possibly some of these will have to be evicted during 1936.

As has been noted in earlier reports, inadequate drainage and failure to keep growing crops weeded are the chief faults. Most of the allottees are beginning to realise that good cane crops cannot be obtained on this land with late cultivation and planting but there are still a number who plant at least portion of their cane areas as late as May or June.

The Greencastle allottees supplied 1,465 tons of cane to Bendals Factory for the 1935 crop. This was purchased at 13s. 11½d. per ton (including bonus), the gross value amounting to £1,025. 4. 10½. After deduction of weighing charges and sums due to the Government as loans or instalments of the purchase price of lots, the balance of £713. 3. 0. was paid to the allottees through the Agricultural Department.

The 1936 crop will be reaped from 190.6 acres (including 91.6 acres plant cane) and is estimated at 2,300 tons.

Free cane plants were again supplied to new allottees and in addition allottees generally were supplied free of charge with limited numbers of cuttings of promising new varieties from the nurseries at the Experiment Station. Free fruit trees (mangoes and bread fruit) were also supplied.

During 1935, £4:9:3. was spent on drainage and estate roads and £62:2:6 and £26:1:6 advanced for cultivation and fertilizers respectively.

Matthews. At the end of December 117 lots out of a total of 137 available were occupied. There were no evictions during the year.

The 1935 crop amounted to 766 tons 18 cwt. 2 qrs. of which 765 tons 9 cwt. 0 qrs. were sold to the Antigua Sugar Factory at 13/6 per ton and the balance to Bendals at 12/– per ton.

After deduction of packing, weighing and supervision charges and of sums due to the Government for loans, instalments of the purchase price etc. the balance £363:5:3. was paid to the allottees.

The 1936 crop will be reaped from 113.6 acres (including 56.2 acres plant cane) and is estimated at 985 tons.

During the year £1:4:5. was spent on drainage of the estate and £5:10:0. and £22:13:4. advanced for cultivation and fertilizers respectively.

Jonas's. At the end of 1935 64 plots out of a total of 68 available were occupied.

The 1935 crop amounted to 485 tons 13 cwt. 1 qr. This was sold to the Antigua Sugar Factory at 13/11½ per ton, the gross value being £337: 9: 4. After the usual deductions the allottees received £274: 8: 2.

The 1936 cane crop will be reaped from 64.7 acres (including 41.3 acres plant cane) and is estimated at 805 tons.

During 1935 £31: 2: 0. was spent on the provision of free planting material and £5: 8: 6. on roads and drains. £24: 6: 3. and £14: 14: 2. were advanced for cultivation and fertilizers respectively.

The following table shows the allocation of the crop revenues from the three Land Settlements during the period under review. The total gross receipts amounted to £1,878: 5: 1½ and the total reaping, packing and weighing charges to £39: 9: 9, and the unpaid balances to 5/10½, so that the allottees received £1,838: 9: 6. either in cash, fertilizer or in instalments of the purchase price of their plots.

SUMMARY SHOWING ALLOCATION OF CROP REVENUES FROM THE LAND SETTLEMENT SCHEMES, 1935

Settlement.	Total Value Received.	Rents Deducted.	Agricultural Loans Deducted.	Supervision* Weighing and Packing Charges.	Net Proceeds Paid.	Balance Unpaid
Greencastle	1,025 4 10½	201 9 1½	107 9 1	3 1 2½	713 3 0	2 5½
Matthews ...	515 10 11	78 2 11	51 13 8½	22 6 3½	363 5 3	2 9
Jonas's ...	337 9 4	47 18 3	1 0 0	14 2 3	274 8 2	8
	1,878 5 1½	327 10 3½	160 2 9½	39 9 9	1,350 16 5	5 10½

* Bendals—Weighing ½d. per ton.
Matthews & Jonas's—Weighing 1d. per ton.
Packing 4d. per ton.
Supervision 2d. per ton.

APPENDIX 2.

METEOROLOGICAL.

RETURN OF RAINFALL ON THE FOLLOWING PLACES IN ANTIGUA FROM 1ST JANUARY TO 31ST DECEMBER, 1935.

No.	Station.	January.	February.	March	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.
1	Botanic Station ...	2·87	1·26	1·10	1·75	3·39	3·03	5·84	3·73	5·06	12·47	6·56	2·02	49·08
2	Blakes	2·73	2·31	0·99	1·54	3·22	3·59	4·19	2·73	6·01	9·91	8·00	3·37	48·59
3	Bendals Factory ...	4·54	1·82	0·94	2·06	2·82	4·50	6·10	3·73	5·56	8·00	5·54	2·51	48·12
4	Orange Valley ...	2·15	2·64	2·10	1·44	3·75	4·15	4·04	3·60	4·46	9·61	4·60	2·50	45·04
5	Cedar Valley ...	1·22	0·84	1·05	4·02	1.56	1·87	4·63	4·50	4·99	10·57	6·36	1·91	43·52
6	Bennett Bryson's Office	1·92	0·93	0·93	1·50	2·28	2·87	6·25	4·16	4·38	10·44	6·13	1·63	43·42
7	Betty's Hope ...	0·69	1·03	0·90	1·35	2·12	3·48	5·78	4·30	5·42	9·06	6.91	2·30	43·34
8	Five Islands ...	2·12	0·90	0·61	1·97	1.75	5·04	7·41	3·62	3·71	9·08	4·86	1·90	42·97
9	Antigua Sugar Factory	1·40	0·93	1·33	2·08	1·87	2·38	6·25	3·56	4·19	10·66	5·97	1·86	42·48
10	Carlisle	1·24	1·60	1·10	2·60	3·40	3·80	3·20	3·60	3·40	5·80	7·65	4·86	42·25
11	Creekside	2·15	1·42	1·11	1·15	3·26	4·04	6·44	2·36	4·12	10·56	3·11	2·06	41·78
12	Delaps	1·47	1·60	1·34	1·38	2·67	3·65	4·26	2·98	5·31	7·20	7·58	2·33	41·77
13	Pattersons ...	1·33	1·75	1·79	3·24	2·25	2·35	3·28	1·92	4·88	7·98	8·10	2·86	41·73
14	Langfords	1·33	0·90	1·64	4·04	1·59	1·33	3·74	3·54	5·50	12·35	4·32	1·44	41·72
15	Sandersons ...	2·35	1·25	1·02	3·14	1·92	2·35	5·10	3·97	5·45	6·04	7·03	1·96	41·58
16	Judges	1·15	1·19	1·34	3·98	1·71	1·30	3·49	4·22	4·87	11·60	4·83	1·42	41·10
17	Diamond	1·00	1·25	0·78	1·94	2·19	2·17	5·32	4·24	5·81	8·35	6·32	1·40	40·77
18	New Division ...	2·10	1·42	1·36	1·57	2·07	5·40	5·83	2·95	4·85	7·91	3·12	2·15	40·73
19	Belmont	2·02	1·31	1·30	1·23	2·59	2·96	5.03	2·88	3·93	11·31	3·53	2·32	40·41
20	Paynters	1·90	1·24	1·00	2·09	2·17	1·63	4·53	3·89	4·12	10·09	5·33	2·22	40·21
21	Vernons	1·37	0·32	0·74	2·43	1·81	2·19	5·40	3·36	4·59	7·95	4·81	4·81	39·78
22	Marble Hill ...	1·35	1·32	1·22	2·97	1·60	1·60	3·25	4·13	4·46	11·20	5·00	1·21	39·31
23	Thibous	0·93	0·61	1·63	3·57	1·77	1·63	3·22	3·63	4·47	9·58	5·95	1·89	38·88
24	Wallings Dam ...	2·00	1·34	1·49	0·25	2·07	3·97	3·50	2·78	4·84	8·65	5·41	2·36	38·66
25	North Sound ...	2·07	0·48	0·73	3·21	1·37	2·47	4·28	3·24	4·18	8·78	6·02	1·74	38·57
26	Weatherills ...	0·59	1·22	1·45	2·81	2.07	2·09	3·43	3·74	4·97	10·54	4·22	1·29	38·42
27	Wallings Hill ...	2·02	1·31	1·48	0·23	2·08	3·83	3·53	2·72	4·75	8·56	5·49	2·33	38·33
28	Morris Looby's ...	1·58	1·64	0·65	3·01	1·91	2·68	4·09	1·82	4·05	5·65	8·49	2·57	38·14
29	Willis Freemans ...	0·92	1·89	1·01	3·01	1·78	2·56	4·09	2·89	4·64	6·74	6·43	2·13	38·09
30	Duers	1·42	1·08	0·84	2·78	1·40	2·10	4·79	3·80	4·64	6·20	6·95	1·90	37·90
31	Burkes	1·74	1·67	1·25	2·00	1·68	2·95	4·42	3·04	4·16	5·94	5·26	3·72	37·83
32	Parham Hill ...	1·01	0·41	0·47	2·03	1·07	1·77	4·50	2·94	4·54	6·81	7·27	4·95	37·77

RETURN OF RAINFALL ON THE FOLLOWING PLACES IN ANTIGUA FROM 1ST JANUARY TO 31ST DECEMBER, 1935.

No.	Station	January	February	March	April	May	June	July.	August	September	October	November	December	Total.
33	Lyons	0·38	1·47	0·76	1·20	3·87	2·06	3·64	2·47	4·37	10·25	4·99	1·99	37·45
34	Fitches Creek ...	1·24	1·39	1·05	2·99	2·16	1·35	4·48	3·13	3·63	8·63	5·03	1·98	37·06
35	Comfort Hall ...	0·18	0·62	0·63	0·10	1.97	1·28	4·02	4·43	4·65	10·96	5·43	2·65	36·92
36	Collins	0·83	0·95	0·71	0·87	1·95	1·63	3·98	3·44	4·30	9·46	7·06	1·65	36·83
37	Parham New Work	0·73	0·46	0·46	1·61	1·68	2·02	5·21	3·77	4·30	7·65	7·16	1·68	36·73
38	Blackmans ...	0·95	0·74	1·08	2·89	2·54	1·35	4·94	2·99	4·23	7·98	5·13	1·61	36·43
39	Weirs	0·97	0·81	0·99	2·63	2·01	1·41	5·26	3·25	3·26	9·14	5·09	1·38	36·20
40	Gaynors ...	0·82	1·07	0·96	0·39	2·21	1·96	4·19	2·57	5·20	10·01	5·10	1·45	35·93
41	Pares & Cochranes	0·70	0·54	0·40	1·66	2·01	1·45	4·75	3·27	4·62	7·92	6·57	1·95	35·84
42	Cassada Garden ...	1·08	1·06	0·67	2·55	1·47	1·90	4·41	3·06	3·06	9·65	5·12	1·60	35·63
43	Cochranes and Thomases ...	0·89	1·60	0·58	1·84	1·54	2·19	3·55	1·37	3·93	7·51	7·89	2·51	35·40
44	Gilberts	0·55	0·66	0·57	1·21	1·20	2·15	3·87	3·17	3·50	9·59	6·53	2·11	35·11
45	Ffryes	0·50	1·49	0·69	1·52	2·85	2·12	2·33	2·24	4·50	9·64	4·60	2·45	34·93
46	The Garden ...	0·83	1·26	0·46	1·17	2·43	1·33	3.14	3·28	4·72	8·73	6·25	1·24	34·84
47	Yeptons	1·05	0·58	0·52	1·21	1·53	2·83	5·43	4·78	3·39	8·70	3·68	1·13	34·83
48	Millars	1·24	1·60	1·10	2·60	3·40	2·80	3·20	4·00	3·10	3·80	4·10	3·86	34·80
49	Parham Lodge ...	0·67	0·72	0·76	1·00	1·36	1·18	5·22	2·90	4·01	7·72	7·38	1·86	34.78
50	Donovans	1·14	0·79	0·82	2·95	0·60	1·32	5·09	2·60	3·28	8·25	4·97	1·74	33.55
51	Yorkes	1·29	1·49	0·94	1·38	1·13	3·68	4·79	2·72	4·60	7·02	2·91	1·52	33·47
52	Long Lane ...	0·56	1·14	0·78	0·96	2·29	1·83	3·60	2·95	3·79	8·25	5·64	1·49	33·28
53	Mercers Creek ...	0·50	0·66	0·45	1·07	1·06	1·68	3·53	2·82	3·14	9·20	7·00	1·64	32.75
54	Cooks	1·90	1·20	0·66	1·40	2.60	3·01	1·26	3·75	3·48	9·00	3·22	0·97	32·45
55	The Cotton ...	0·54	0·41	0·31	0·70	1·23	0·85	4·52	2·55	2·86	8·10	6·38	1·42	29·87
56	Montpelier ...	0·67	1·22	0·70	0·92	3·26	1·23	2·23	1·25	3·60	7·30	4·35	2·01	28·74
57	High Point ...	0·74	0·67	0·92	2·47	1·25	1·01	2·94	3·15	4·31	5·67	3·45	1·10	27·68
	Codrington Village, Barbuda ...	2·84	0·94	0·36	5·57	0·39	1·99	3·69	2·55	3·39	4·65	2·81	1·23	30·41

AVERAGE RAINFALL 1874—1935.

								ins.
In	1874	the	average	rainfall	on	41	stations	was 31.16
	1875	„	„	„	„	40	„	„ 28.78
	1876	„	„	„	„	36	„	„ 41.98
	1877	„	„	„	„	38	„	„ 49.05
	1878	„	„	„	„	53	„	„ 47.11
	1879	„	„	„	„	52	„	„ 61.54
	1880	„	„	„	„	46	„	„ 49.68
	1881	„	„	„	„	44	„	„ 53.75
	1882	„	„	„	„	45	„	„ 33.04
	1883	„	„	„	„	56	„	„ 55.51
	1884	„	„	„	„	56	„	„ 43.98
	1885	„	„	„	„	53	„	„ 43.39
	1886	„	„	„	„	55	„	„ 47.78
	1887	„	„	„	„	50	„	„ 43.68
	1888	„	„	„	„	47	„	„ 44.23
	1889	„	„	„	„	50	„	„ 73.59
	1890	„	„	„	„	45	„	„ 33.00
	1891	„	„	„	„	45	„	„ 50.01
	1892	„	„	„	„	53	„	„ 38.43
	1893	„	„	„	„	54	„	„ 38.69
	1894	„	„	„	„	68	„	„ 38.85
	1895	„	„	„	„	69	„	„ 52.91
	1896	„	„	„	„	56	„	„ 59.85
	1897	„	„	„	„	54	„	„ 39.67
	1898	„	„	„	„	66	„	„ 48.85
	1899	„	„	„	„	63	„	„ 47.50
	1900	„	„	„	„	64	„	„ 36.95
	1901	„	„	„	„	65	„	„ 57.61
	1902	„	„	„	„	71	„	„ 58.80
	1903	„	„	„	„	68	„	„ 43.68
	1904	„	„	„	„	70	„	„ 37.01
	1905	„	„	„	„	68	„	„ 31.40
	1906	„	„	„	„	66	„	„ 53.93
	1907	„	„	„	„	70	„	„ 43.45
	1908	„	„	„	„	72	„	„ 43.79
	1909	„	„	„	„	70	„	„ 45.15
	1910	„	„	„	„	70	„	„ 34.77
	1911	„	„	„	„	72	„	„ 36.47
	1912	„	„	„	„	72	„	„ 32.20
	1913	„	„	„	„	73	„	„ 42.76
	1914	„	„	„	„	72	„	„ 36.86
	1915	„	„	„	„	75	„	„ 56.14
	1916	„	„	„	„	74	„	„ 58.23
	1917	„	„	„	„	70	„	„ 36.62
	1918	„	„	„	„	70	„	„ 37.87
	1919	„	„	„	„	70	„	„ 49.56
	1920	„	„	„	„	70	„	„ 30.09
	1921	„	„	„	„	74	„	„ 30.32
	1922	„	„	„	„	70	„	„ 35.14
	1923	„	„	„	„	68	„	„ 32.41
	1924	„	„	„	„	67	„	„ 41.57
	1925	„	„	„	„	68	„	„ 30.75
	1926	„	„	„	„	70	„	„ 50.20
	1927	„	„	„	„	67	„	„ 45.84
	1928	„	„	„	„	63	„	„ 33.24
	1929	„	„	„	„	66	„	„ 40.78
	1930	„	„	„	„	59	„	„ 25.51
	1931	„	„	„	„	63	„	„ 48.62
	1932	„	„	„	„	63	„	„ 58.47
	1933	„	„	„	„	59	„	„ 41.50
	1934	„	„	„	„	60	„	„ 41.86
	1935	„	„	„	„	57	„	„ 38.31

AVERAGE MONTHLY RAINFALL, 1935.

	inches.
January ..	1.33
February ..	1.15
March ..	0.96
April ..	1.96
May	2.08
June ..	2.41
July ..	4.36
August ..	3.24
September	4.35
October	8.70
November	5.65
December	2.12
	38.31

The average rainfall for 62 years is 43.36 inches, so that the rainfall for the year 1935 is 5.05 inches below the average.

METEOROLOGICAL SUMMARY, 1935.

Kept at the Botanic Station, Antigua.

Month	Thermometer								Barometer Reading		Rainfall Botanic Station	Barometer Corrected		Thermometer	
	Dry		Wet		Relative Humidity %		Maximum	Minimum	9 A M	3 P M		Highest	Lowest	Highest Max.	Lowest Min.
	9 A M	3 P M	9 A M	3 P.M.	9 A M	3 P M									
January ...	77·0	79·1	72·1	72.9	78·2	73·5	82·0	69·0	30·047	29·966	2·87	30·116	29·862	86	66
February ...	77·2	79·5	72·6	73 8	79·7	75.7	82·8	70·7	30·098	30·031	1·26	30·141	29·986	85	69
March ...	78·1	80·4	71·3	71 9	71·3	64·7	83·2	70·8	30·118	30·049	1·10	30·207	30·005	86	69
April ...	80·0	82·4	73·1	73.8	71·0	65·5	85·6	71·9	30·047	29·979	1·75	30·116	29·910	90	70
May ...	80·4	82·6	75·4	77.1	79·1	77·1	85·7	73·4	30·052	29·990	3·39	30·133	29·915	88	70
June ...	82·3	84·1	76·3	77·2	75·4	72·6	87.7	74·9	30·057	30·008	3·03	30·105	29·970	95	71
July ...	82·8	84.3	76·8	77·7	75·8	73·3	86.9	75·3	30·063	30·021	5·84	30·132	29·936	88	71
August ...	83·8	85·3	77·7	78.7	75·3	73·5	88·1	75.6	30·004	29·952	3.73	30·089	29·893	92	72
September ...	83·6	84.4	77·9	78.0	76·8	74·6	87·8	75·7	30·016	29·954	5·06	30·065	29·913	90	72
October ...	82·2	82·0	76·6	76.4	77·2	77·6	86.7	73·7	29·974	29·900	12·47	30·096	29·835	92	71
November ...	80·6	81.9	76·5	76.9	82.6	79·6	84.8	73·3	29·975	29·897	6·56	30·037	29·840	90	69
December ...	79·6	80·2	73·4	73·7	73·6	72·8	82·9	71.6	30·056	29·976	2·02	30·119	29 906	85	69
											49.08				
Means for the Year ..	80·6	82·2	75·0	75·7	76.3	73·8	85·4	73·0	30·042	29·977					

Highest Maximum Temperature = 95° on 27th June.
Lowest Minimum „ = 66° on 26th and 28th January.
Highest Barometer (corr.) = 30.207 on 13th March.
Lowest Barometer (corr.) = 29.835 on 23rd October.
Greatest Rainfall in 24 hours = 3.93 ins. on 31st October.

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